Marine Engineering
and Shipping Age

Volume XXXIII **August, 1928** **Number 8**

Published Monthly by the
SIMMONS-BOARDMAN PUBLISHING COMPANY
34 North Crystal Street, East Stroudsburg, Pa., with executive offices at 30 Church Street, New York

H. H. Brown, Editor
L. S. Blodgett, Managing Editor
Warner Lumbard, Associate Editor

James Swan, Contributing Editor

Subscription price: United States, Canada and Mexico, $3.00; foreign countries, $4.00. Single copy, 35 cents.

Marine Engineering and Shipping Age is a member of the Associated Business Papers, Inc. (A. B. P.), and the Audit Bureau of Circulations (A. B. C.).

Request for change of address should reach us on or before the 15th of the month preceding the issue with which it is to go into effect. It is difficult, and often impossible, to supply back numbers to replace those undelivered through failure to send advance notice. In sending us change of address, please be sure to send us your old address as well as the new one.

Freeboard

THE recent completion of the organization of an American freeboard committee furnishes additional proof, if any were needed, of the serious entry of the United States into the ocean trades of the world. The formation of such a committee was a foregone conclusion, if this country were to undertake, in its own vessels, any material part of its overseas commerce, and it is a matter for congratulation that preparations are being made for the provision of a scientific and systematic handling of this most important matter.

So long as American ships were, for the most part, engaged in coastwise service, the regulation of freeboard, though undoubtedly desirable in principle, could not be considered essential. The coastwise ships were in general of such design and their cargoes and loading of such nature that ample freeboard, at least in steam vessels, was nearly always provided. Deadweight cargoes, particularly coal, were largely handled by sailing vessels or barges, and these, while sometimes too deeply laden for safety, were, in general, satisfactory. At any rate, the losses which could definitely be attributed to lack of freeboard were not sufficiently serious to make its regulation by statute appear to be an essential matter.

The situation changed, however, with the appearance in the Atlantic coast coal trade, in the early years of the present century, of a considerable number of steam colliers. It so happened that many of these steamers were operated by former owners of the wooden coal schooners and tow barges which for many years had had a practical monopoly of the coal carrying business from the Delaware and Chesapeake to New York and New England ports. Owing to the relatively heavy hulls and small ratio of cubic capacity to displacement of these wooden vessels, they could be filled very nearly full of coal and still not be too deeply loaded for fairly safe navigation, but the same practice when applied to steel ships with light hulls and holds which extended practically to the inside of the shell plating gave rise to more or less trouble. So far as the writer is aware, none of these colliers was lost or got into serious difficulty through stress of weather, but certain of them did show evidences of structural strain and other indications of stress due to the combined action of overloading and heavy seas. These symptoms were not long in being recognized, and corrective measures—limiting the loading of the existing steamers and increasing certain topside scantlings in those afterwards constructed—were put in effect. These remedies were, however, entirely of an individual nature, carried out by the various operators as they saw fit, and there was no attempt to bring about any uniform regulation of freeboard through government agencies. In fact the latter was generally looked upon with distrust and as a possible unwarranted interference with personal rights.

So far as the remainder of the coastwise vessels was concerned, they had in general, as has already been stated, ample freeboard to meet the conditions of their service. They were, for the most part, of what is known in this country as the hurricane deck type, corresponding very nearly to the awning deck ships of Great Britain and European countries. They carried measurement and not deadweight cargoes and had, usually, some passenger accommodations in the upper 'tween decks and in deck houses. While their topsides and upperworks were light, there was sufficient strength successfully to withstand the buffetings of the by no means pacific winter weather of our North Atlantic coast. The regulation of their freeboard, other than might appear advisable by individual owners or operators, had received no very serious consideration.

Such, in general, was the state of things in 1914. The coastwise colliers had developed along healthy lines and were proving highly successful, safe and efficient, while the hurricane deckers, with increasing size, had much greater structural strength and were altogether more satisfactory vessels than their predecessors.

With the entry of this country into overseas work, which, very shortly, followed the commencement of the

Generated on 2024-09-12 14:20 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

world war, conditions changed, as it were, over night. An entirely different class of ships from the coasters was needed and, while many of them were drafted and rendered excellent service, the new construction followed closely the lines of the already highly-developed deep-sea, 10-knot tramp steamer. The latter was essentially a "deadweight" proposition. They were built and largely chartered and operated on a deadweight-ton basis and an exact determination of their freeboard and draft was essential. Lacking an American agency, this was done by the application of foreign rules, not because the government required it but for the reason that uniformity of measurement was a commercial necessity. For the period of the war, and the feverish activity in shipping which immediately followed it, this state of affairs continued, but with the return of more nearly normal conditions and the participation of this country in foreign trade on a commercial and not a war basis, the necessity of regulating freeboard and, in consequence, deadweight became increasingly apparent and legislation to this effect was introduced in the Congress.

While the regulations promulgated when these laws are enacted will undoubtedly follow more or less closely those of the load line committee in Great Britain, whose work in this department of naval architecture has been a monumental one, it seems fairly certain that, as regards tank steamers, somewhat wide departures from existing freeboard tables will be made. As most of our readers are doubtless aware, America is the possessor of the largest fleet of commercial tank steamers and in consequence has at its command a very large accumulation of experience and data bearing upon the operation of this class of vessel. American tank vessels are almost invariably operated at deeper draft than foreign ships of corresponding class and dimensions, the decrease in freeboard in favor of the American craft, while variable, amounting usually to as much as 15 or 20 percent of the "rule" freeboard. This decreased freeboard has not proved prejudicial to the seagoing qualities of the American vessels, and is, of course, greatly to their advantage, so far as cargo-carrying capacity is concerned. There can be no doubt but that reduced freeboard for tankers will receive favorable consideration from the American committee and such action would very likely be followed by a corresponding modification of the foreign rules.

There is another class of vessel which, in the writer's opinion at least, should receive most careful consideration. This class comprises the coastal steam colliers, already referred to and which, to a certain extent, are comparable to tankers. British vessels of this class, while in general of somewhat smaller tonnage than ours, presumably operate on standard freeboard and should prove at least as seaworthy as ours which have no freeboard regulations applied to them. If one can judge, however, from the reports in the British shipping journals, their colliers are not infrequently in trouble and a number of them have been lost at sea—the result, apparently, of deep loading, insecure hatch covers or a combination of both causes. The American steamers, on the other hand, are almost invariably fitted with heavy hinged steel hatch covers and, so far as the writer knows, not one of them has been lost at sea as the result of heavy weather. It is submitted that these vessels, in view of their very satisfactory performance, are deserving of the most favorable consideration when the determination of their minimum allowable freeboard comes up for the consideration of the new committee.

So far as other classes of ships are concerned, it would appear that existing rules may well be followed closely. These rules are the result of an enormous amount of the most painstaking research and constructive work on the part of experienced men of recognized ability and fitness for their task. Both qualitatively and quantitatively they have, by experience, been proved to be fundamentally sound and satisfactory. Some modifications, as applied to American coastwise craft, may be found desirable, but for ocean-going vessels any very radical departure from existing and generally accepted freeboard tables would seem to be not only unnecessary, but, from the commercial point of view, ill-advised if not altogether impracticable.

Steering

THERE is no quality of ships which comes in for more comment and discussion by those who handle them than their "handiness" or, as the text-books have it, their "maneuverability." The steering of a ship, in one sense, is as important as her propulsion, for lacking a guiding hand mere progress through the water is futile. Beyond this elemental fact the equality in value of the two functions does not go, however, for except in a few exceptional cases efficiency of propulsion is of paramount importance and the actual efficiency of steering appliances is a secondary matter.

The question of steering is somewhat confused by the fact that the statement that a ship steers well may in one case mean one thing and in another quite the opposite, "good" steering or "bad" steering depending to a large extent upon the nature of the service in which the particular vessel under consideration is employed. Thus, for a sea-going ship, the ability to hold a straight course with the least possible helm movement and consequent drag on the rudder will be the principal factor in establishing a reputation for good steering while for a harbor tug the ability to turn quickly and positively is of first importance and the fact that the quartermaster and the steering engine have relatively more work to hold a straight course is secondary. Between these two extremes comes a large class of vessels in which the value of steadiness on a course and of handiness are more nearly balanced. Bay and sound steamers have usually to dock several times a day, "night" boats at least three times every twenty-four hours and in some services much more frequently. With even the

Generated on 2024-09-12 14:19 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

large coast steamers several dockings a week are a regular characteristic of the service. For all of these vessels the ability to hold easily to a straight course is a most important matter but, if the quality is coupled with inability to turn quickly, the ship's service will be characterized by frequent and most annoying delays in docking. Under certain combinations of bad weather and crowded water her lack of handiness may easily prove a serious matter if not a positively dangerous one.

For larger sea-going vessels, good steering is mainly a question of clear lines and of balance between the lateral areas below and above the waterline. Given a clear flow of water to the rudder, it is surprising how small the latter may be and yet function perfectly in holding the ship on her course even in a rough sea. This kind of rudder efficiency is amply demonstrated by the gyro-controlled steering gear or "Metal Mike" which of recent years has gained such a high and well deserved reputation. On the other hand, if the run is too full for the speed at which the ship is driven, unstable eddies are likely to develop, the wake is more or less broken up and irregular and no practicable increase in size of rudder will serve to hold her on her course without constant vigilance on the part of the quartermaster and an undue expenditure of power and steam by the steering engine.

For sea-going vessels of moderate speed and good form a rudder having an area of from 1½ to 2 percent of the lateral immersed plane of the vessel seems to be sufficient for all practical purposes, the area being kept down as much as practicable to reduce the load on, and in consequence the size of, the steering engine. For faster vessels of the same type balanced rudders with their lower area extending under and forward of the lower pintles are frequently made use of, increased turning moment being thus obtained without unduly adding to the load on the rudder stock and steering gear. With all such ships, steady steering at sea is the main consideration and docking is nearly if not always accomplished with the aid of harbor tugs.

Going to the other extreme—the harbor tugs themselves—handiness is paramount and large rudders, not only for running in free course, but because of propeller action upon them when maneuvering, are essential. In railroad transfer tugs the rudder area may be as much as 7 percent of the lateral immersed plane while in sea-going tugs the percentage will run from 3 to 4.

Quickness of handling is often further accentuated in towboats by thickening the after edge of the rudder, either by a gradual thickening from the stock aft or by the addition of vertical "cheek pieces" of triangular section on each side, at the after edge. This device of course adds to the resistance to forward motion but materially quickens the response of the tug to slight angles of helm. It also appears to aid the combined action of rudder and propeller when maneuvering in limited spaces.

In the third or intermediate class of vessels, the ship designer is faced by more or less conflicting requirements. While it is obviously desirable that these ships should drive as easily and economically as possible with but little rudder action required to keep them steadily in a desired course, it is almost equally essential that they should, by hand, respond quickly to the helm and be under absolute control when going either ahead or astern. Nearly all such vessels have comparatively fine lines, clean runs and, with the exception of those where light draft of water makes necessary a wide flat hull with heavy quarters, they may be kept on a true course with a comparatively small amount of rudder action. The fact that their exposed lateral surface is usually large as compared with the lateral immersed plane makes necessary a somewhat larger rudder than is required for a ship of deep-draft, sea-going type of the same length—this in order successfully to counteract wind actions. Given clean lines and satisfactory performance, so far as steadiness is concerned, the obvious method of ensuring handiness is by the fitting of a large rudder with correspondingly powerful steering engines and coast, sound and bay steamers are usually so provided, particularly those of relatively light draft. The largest rudders are found on paddle steamers, which, while they can be stopped and started more quickly than a screw-propelled vessel of the same size and power, cannot be maneuvered by means of the main engine as readily as the latter, the paddle wheels not being able to throw the head one way or the other as can be done by the combined action of propeller and rudder in a screw vessel.

The large side-wheel steamers on Long Island Sound have a rudder area of around 2.8 percent of the lateral plane and very powerful steering engines of the Sickles type in which the crank shaft of the engine is attached directly to the drum operating the tiller ropes, without any intermediate gearing. Moreover, in this gear the diameter of the wheel rope drum varies, being greatest at the point where the ropes lead off when the helm is amidships, and least when the helm is hard over. By this means rapid rudder movement is obtained when starting to turn and the load on the steering gear is light and slow movement and great power when the helm is hard over and under a heavy load. The result is a combination of steadiness on a course and handiness when docking which it is believed has never been excelled in vessels of equal length and power. Screw-propelled steamers of the same class, if of any considerable size, are in the majority of cases fitted with twin screws which insure ease of handling but, as most of the captains and pilots dislike to use the propellers independently of each other except in coming to or leaving docks, large rudders are usually fitted and, to further facilitate turning, the deadwood is not infrequently more or less cut away.

The cutting away of deadwood aft or of forefoot forward has long been a prolific subject for discussion. The raising of the keel line either forward or aft naturally

Generated on 2024-09-12 14:14 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

decreases a ship's resistance to turning or other lateral movement and furthermore any reduction of the after part of the lateral plane throws its center farther forward and consequently increases the turning movement exerted by the rudder upon the ship. But while the moving forward of the center of lateral resistance may undoubtedly increase a ship's handiness, if carried too far it is likely to make her unsteady and difficult to hold on a straight course. One of the large side wheelers before mentioned furnishes a case in point. Originally built with a gradually rising keel line aft, this vessel was found to steer badly, requiring constant attention to hold her on a true course. Eventually a skeg or fin was added, bringing the keel line down to the midship depth from the foot of the stern post forward. After this was done, no further trouble was experienced.

If not carried too far, cutting away of deadwood will in most cases materially increase a ship's handiness but experience seems to indicate that, if it is cut away immediately forward of the rudder, as is the case with the propeller aperture in a single-screw vessel, the effectiveness of the rudder is materially decreased. This fact is borne out by the behavior of three twin-screw sound steamers with which the writer is familiar. These vessels are all of the same type and have similar lines, propellers and general characteristics, both of hull, propelling machinery and steering gear. The location of the propellers, relative to the rudders, shell plating and base line is practically the same in all three, but while two have complete "deadwoods," the shell plating extending continuously back to the stern post, the third has an aperture, similar to that of a single-screw vessel, immediately forward of the stern post. While all three steamers are steady and can be kept upon a straight course without difficulty, the one in which the aperture is fitted is noticeably slower than the others in answering the helm and has been the subject of complaints of "bad steering" on the part of the various officers who have had charge of her. The prejudicial effect of a screw aperture upon the turning moment of the rudder seems also to be indicated by investigations undertaken by Mr. G. H. Bottomley in the British National Experimental Model Tank. These experiments, while not entirely conclusive, show a gain in effective pressure set up on the stern by the rudder of a twin-screw ship, due to closing up an ordinary propeller aperture, of around 70 percent. They further indicate a gain of from 3 to 10 percent due to the filling in of the relatively small space usually left clear between the rudder post and the rudder.

Although increased pressure on the rudder does not necessarily indicate a corresponding increase in maneuverability, as any deadwood or similar fore and aft surface must act as more or less of a drag against turning, it seems fairly certain that some deadwood just forward of the rudder has a favorable effect upon the steering qualities of a vessel, while the lack of it materially reduces the effectiveness of a rudder of the ordinary type.

Steering is a broad subject—the present article touches only upon certain of its practical aspects which from time to time have come to the writer's attention. The recent introduction of special rudders, such as the Flettner, and the intensive study of the inter-action between rudder and propeller have opened up an extensive field for the improvement of steering devices as well as for propulsion itself.

Steamship Performance

THAT the performance of steamships can be materially improved has long been recognized by both shipowners and shipbuilders. Actual results, of course, are what count and the performance of the new Canadian Pacific transatlantic liner *Duchess of Bedford* is a striking example of what may be looked for when advantage is taken of the latest developments in steam power plant practice.

This vessel is a twin-screw, geared-turbine steamer of 20,100 gross tons, 600 feet long and 75 feet beam, with a load draft of 27 feet, designed for a service speed of 17½ knots. She was built on the Clyde by John Brown & Company, Ltd., with a guaranteed fuel consumption of 0.70 pound per shaft horsepower per hour for all purposes. Not only was this figure bettered on the official trials but we are informed by Mr. John Johnson, chief superintendent engineer of Canadian Pacific Steamships, Ltd., that the results obtained on the maiden voyage of the vessel were an improvement over the trial results. The fuel rate during the homeward voyage from Canada was 0.62 pound per shaft horsepower per hour for all purposes and 0.58 pound for propulsion. It is confidently expected that these results will be steadily maintained in service.

Many things, of course, contributed to the attainment of this remarkable result. The vessel is propelled by twin screws, turning outboard, driven by Parsons triple-expansion turbines through single-reduction gearing. At normal speed the turbines run at 2,000 revolutions per minute and the propellers at 120 revolutions per minute. Steam for the propelling machinery is supplied at a working pressure of 370 pounds per square inch and 250 degrees F. superheat by six oil-fired Yarrow watertube boilers fitted with superheaters and air heaters and operated under forced draft. The deck machinery and as many of the engine-room auxiliaries as possible are electrically driven, steam for the steam-driven auxiliaries being supplied at 200 pounds per square inch by two oil-fired Scotch boilers working under natural draft. By this arrangement the high-pressure watertube boilers are fed with distilled water only, through the Scotch boilers, which excludes dirt and lubricating oil from the main boilers. Combustion air for the main boilers is preheated to 320 degrees F. and the feed water is delivered at a temperature above 300 degrees F.

As an example of advanced engineering practice this vessel points the way for a general improvement in steamship economy.

Generated on 2024-09-12 14:20 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

Marine Act of 1928 Goes Into Effect

Shipping Board lines advertised for sale—First mail contract bids awarded—Fuel oil bid accepted—Plans for merchant marine reserve

By Harold F. Lane

WASHINGTON, D. C.

AFTER much discussion and argument pro and con for a long time, the Shipping Board on July 3 took action directing the Merchant Fleet Corporation to prepare specifications and advertisements for bids for the sale of the United States Lines and the American Merchant Lines, on eight alternative methods of bidding, and also for the sale of the American Palmetto Line. The advertisements for bids will give no definite assurance that the lines are actually to be transferred to private ownership, because that will depend upon the nature of the bids offered, but Chairman O'Connor stated at the close of the meeting at which it was decided that he was hopeful of receiving satisfactory bids for the vessels. If they are not satisfactory, he added, the operation of the lines will be continued without interruption as at present, and the question of making the *Mount Vernon* and *Monticello* suitable for service will be taken up.

The vessels of the United States Lines are the *Leviathan, George Washington, America, Republic, President Harding* and *President Roosevelt.* Those of the American Merchant Lines are the *American Merchant, American Banker, American Shipper, American Trader* and *American Farmer.* There are also included in the proposals for sale, the *Monticello* and *Mount Vernon,* now equipped as troop transports and tied up at Norfolk, Va.

The advertisements will not include bids for chartering. They offer the alternative of bidding on a guaranteed operation period of five years and ten years and the board will agree under suitable contract to advance 75 percent of the reconditioning or construction cost.

The alternative plans are as follows:

1. The sale of one combined line of present vessels.
2. The sale of one combined line of the present vessels plus the *Mount Vernon* and *Monticello.*
3. One combined line of present vessels plus an agreement to construct two new ships suitable for fast mail services.
4. A combined line of the present vessels, substituting the *Mount Vernon* and *Monticello,* or an agreement to construct two new ships for the *President Harding* and *President Roosevelt.*
5. The present vessels of the United States Lines plus the *Mount Vernon* and *Monticello,* or two new vessels.
6. Any or all of the vessels of either of these services or the *Mount Vernon* and *Monticello.*
7. The present vessels of the American Merchant Lines.
8. A proposal to buy the American Merchant Line vessels for operation from any North Atlantic or Pacific Coast port other than New York to the United Kingdom or Continental ports.

The Merchant Fleet Corporation also was directed by the Shipping Board on July 3 to prepare advertisement instructions to bidders and forms of bid and contract for the sale of the American Palmetto Line which operates a fleet of ten cargo ships from South Atlantic ports to Continental Europe.

Under the terms of sale as proposed the purchaser will be required to guarantee a minimum of 24 round voyages a year for a five-year period.

The line is now operated by the South Atlantic Steamship Line with headquarters at Savannah, Ga. The vessels, which have an aggregate tonnage of 79,837 are as follows: *Coldwater, Fluor Spar, Liberty Glo, Magmeric, Schoharie, Shickshinny, Sundance, Tulsa, West Haven, West Mahomet.*

Acting under authority of the independent offices appropriation law for the fiscal year 1929, the Shipping Board has directed Commissioner Cone, in charge of ship construction matters, to prepare advertisements for bids for the reconditioning of the *Mount Vernon* and *Monticello.* The act provides that they may be reconditioned at a total cost of not to exceed $12,000,000 for both vessels. Of this total, $10,000,000 may be drawn from the board's ship construction loan fund. Chairman O'Connor said that the purpose of asking bids for the reconditioning was to enable the board to ascertain the cost of such work for consideration in connection with the proposal to offer the United States Lines for sale. He said that if the lines were sold the purchaser would be required to recondition the two vessels and that the board would lend money for part of the cost under the provisions of the act.

First Bids for Mail Contracts Under New Law

The first bids for carrying mail under the new merchant marine act, designed to stimulate American shipbuilding and the carrying of mails in American bottoms, were opened by Postmaster General New on July 9.

Bids were invited for five routes and one bid was received for each of the routes advertised, each bidder making his bid at the maximum figure authorized by the new legislation.

The bidder on route number 4 from New York to Buenos Aires, via Rio de Janeiro and Montevideo and intermediate ports at which the contractor's vessels may call, was the Munson Steamship Lines, New York. The bid was $8.00 per nautical mile on class three vessels.

Route number 5 from New York to Casablanca, Genoa, Alexandria, Piraeus, Salonica, Constantinople, Constanza, and other Mediterranean and Black Sea ports, was bid on by the Export Steamship Corporation of New York at $2.50 per nautical mile with class six vessels.

The American South African Line of New York was the bidder on route number 6 from New York to Cape Town and other ports on the east or south coast of Africa at which the contractor's vessel may call. The bid was $2.50 per nautical mile with class six vessels.

The Grace Steamship Company of New York was the bidder on route number 8 from New York to Valparaiso and intermediate ports at $4.00 per nautical mile on class 5 vessels and $6.00 per nautical mile on class four vessels.

The New York & Porto Rico Steamship Company was the bidder on route 10 from San Juan, Porto Rico, to Santo Domingo, Dominican Republic, at $4.00 per mile on class five vessels.

Class three vessels, described in the specifications, are those capable of maintaining a speed of 18 knots at

Generated on 2024-09-12 14:16 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

sea in ordinary weather, and having a gross registered tonnage of not less than 12,000 tons; class six vessels are those with a speed of 10 knots and a tonnage of not less than 4,000; class four requires a speed of 16 knots and a tonnage of 10,000, and class five requires a speed of 13 knots and a tonnage of 8,000.

Mail Contracts Awarded

On the basis of the bids received, Postmaster General New announced on July 14 that the first contract for ocean mail service under the new act had been awarded to the Export Steamship Corporation. This contract, which is for service between New York and Mediterranean and Black Sea ports, is for a term of ten years and will require the construction of new and faster ships during its operation.

In addition to the award to the Export Steamship Corporation, the following awards were announced:

Munson Steamship Line, from New York to Buenos Aires.

Grace Steamship Company, from New York to Valparaiso.

New York & Porto Rico Steamship Company, from San Juan, Porto Rico, to Santo Domingo, Dominican Republic.

Service on all the routes begins on August 1 for a term of ten years, except that on the Santo Domingo route, which is for three years and eleven months.

Bids Invited for Additional Routes

Postmaster General New announced on July 12, the issuance of advertisements inviting bids on 15 additional ocean mail service routes under the merchant marine act of 1928. Nine of the routes are from Atlantic and Gulf ports while six are from Pacific coast ports, in accordance with Section 402 of the law, which requires that the routes shall be distributed so as equitably to serve the Atlantic, Mexican Gulf, and Pacific coast ports.

The service routes advertised are as follows:

Route No. 15 From Boston to Yarmouth. Not less than 119 trips per annum in vessels of class 3. This service is now being performed by the Eastern Steamship Company.

Route No. 16 From New York to Copenhagen and Helsingfors. Not less than 36 trips per annum in vessels of class 6. This service is now being performed by the American Scantic Line.

Route No. 17 From New York to ports on the West African Coast between Casablanca and Cape Town. Not less than 20 trips per annum in vessels of class 6. This service is now being performed by the American West African Line.

Route No. 18 From New York to Maracaibo. Not less than 52 trips per annum in vessels of class 5 and 6. This service is now being performed by the Red "D" Line.

Route No. 19 From New York, by Port-au-Prince, Kingston, and Cartagena, to Puerto Colombia. Not less than 52 trips per annum in vessels of class 6. This service is now being performed by the Colombian Steamship Company.

Route No. 20 From New York to Havana. Not less than 52 trips per annum in vessels of class 4. This service is now being performed by the Ward Line.

Route No. 21 From New York to Vera Cruz. Not less than 52 trips per annum in vessels of class 5. This service is now being performed by the Ward Line.

Route No. 22 From New Orleans to Progreso. Not less than 36 trips per annum in vessels of class 6. This service is now being performed by the Munson Steamship Line.

Route No. 23 From Galveston or Port Arthur, by Port-au-Prince, to Santo Domingo City. Not less than 52 trips per annum in vessels of class 6. This service is now being performed by Lykes Brothers Steamship Company.

Route No. 24 from San Francisco to Sydney. Not less than 17 trips per annum in vessels of class 4. This service is now being performed by the Oceanic Steamship Company.

Route No. 25 From San Francisco to Manila, via Japanese and Chinese ports. Not less than 26 trips per annum in vessels of class 3. This service is now being performed by the Dollar Steamship Line.

Route No. 26 From Seattle to Manila, via Japanese and Chinese ports. Not less than 26 trips per annum in vessels of class 3. This service is now being performed by the American Mail Line.

Route No. 27 From San Francisco to Colombo. Not less than 26 trips per annum in vessels of class 5. This service is now being performed by the Dollar Steamship Line.

Route No. 28 From Portland to Manila, via Japanese and Chinese ports. Not less than 24 trips per annum in vessels of class 6. This service is now being performed by the State Steamship Company.

Route No. 29 From Portland to Dairen. Not less than 12 trips per annum in vessels of Class 6. This service is now being performed by the States Steamship Company.

Bids will be received in the office of W. Irving Glover, second assistant postmaster general, until 12:00 o'clock noon of August 10, 1928, for routes on the Atlantic and Gulf coast, and until 12:00 o'clock noon of August 20, 1928, for those on the Pacific.

All bids are required to be accompanied by bond in the amount stated in the advertisement.

Ocean Mail Routes Certified

Types of vessels for the ocean mail routes which were recently established by the postmaster general were certified to him by the Shipping Board on July 3. The routes are as follows:

1. New York, Port-au-Prince, Haiti, Kingston, Jamaica, Cartagena and Puerto Colombia. Combination passenger and cargo vessels with suitable refrigeration space being of not less than 5,000 gross tons and having a speed of not less than 16 knots will be required.

2. Portland and Manila via Yokohama, Kobe and Hong Kong, and the route between Portland and Dairen via Shanghai, Tsingtau and Takubar (Tientsin). Vessels designed primarily for the transportation of cargo but with provision for limited passenger service being of not less than 4,000 gross tons and having a speed of not less than 14 knots will be required.

3. New York and other Atlantic ports, and ports on the West African coast, designated by trade route as the American West African Service. Vessels designed primarily for the transportation of cargo but with provision for limited passenger service being of not less than 4,000 gross tons and having a speed of not less than 14 knots, will be required.

4. New York, Copenhagen, and other Scandinavian and Baltic ports. Vessels designed primarily for the transportation of cargo but with reasonable provisions for limited passenger service, being not less than 4,800 gross tons and having a speed capable of maintaining 12 knots at sea in ordinary weather, will be required.

5. Galveston or Port Arthur and ports in Haiti, Porto Rico and Santo Domingo. Cargo vessels with limited passenger accommodations, being of not less than 4,000 gross tons and having a speed of 13 knots, will be required.

6. New York and La Guayra, Puerto Cabello and Maracaibo, Venezuela and Curacao and Aruba, Dutch West Indies, calling at San Juan, Porto Rico. Cargo vessels with limited accommodations for passengers, being of not less than 3,000 gross tons (gross tonnage limited by reason of port conditions) and having a speed of not less than 13 knots, will be required.

7. New York to Vera Cruz via Havana and Progreso. Combination passenger and cargo vessels, being of not less than 6,000 gross tons and having a speed of not less than 15 knots, will be required.

8. New Orleans and Progreso. Combination passenger and cargo vessels, being of about 3,000 gross tons, (size limited by port conditions, shallow draft, etc., at Progreso) and having a speed of about 13 knots, will be required.

9. New York to Havana. Combination passenger and cargo vessels, being not less than 10,000 gross tons and having a speed of not less than 18 knots, will be required.

10. Boston, Mass., and Yarmouth, Nova Scotia. Combination freight and passenger vessels, being not less than 5,000 gross tons and having a speed of not less than 19 knots, will be required.

11. Between San Francisco and Colombo via Hong Kong, Manila and Singapore.

Generated on 2024-09-12 14:15 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

12. San Francisco and Manila, via ports in Hawaii, Japan and China. Twin screw, combination passenger and freight vessels, equipped with appropriate refrigerating space for perishable cargo, being not less than 12,000 gross tons and capable of maintaining a speed of 18 knots at sea in ordinary weather, will be required.

13. Seattle and Manila, via ports in Japan and China. Twin screw, combination passenger and freight vessels equipped with appropriate refrigerating space for perishable cargo, being not less than 12,000 gross tons and capable of maintaining a speed of 18 knots at sea in ordinary weather, will be required.

The postmaster general had selected these routes, in addition to those on which bids had already been asked, as necessary for the carrying of the mails, and referred them to the board for ruling as to the types of vessels and other specifications that should be met by vessels operating such services.

The Shipping Board has issued a statement expressing "the sense of the board" that mail contracts under the Jones-White shipping legislation should provide for new or improved vessels for the services, the first of such vessels to be entered on the service not later than three years after the signing of the mail contract.

"The board feels," it said, "that Congress has unmistakably recorded its purpose in enacting the Jones-White act—that purpose is to build up a privately owned merchant marine comparable in quality with the merchant fleets of other nations. The bulk of the freighters now in operation under the United States flag do not meet those requirements, and therefore new construction is imperative or the purpose of the law will be defeated. The board is in agreement on this interpretation of the purpose of Congress in passing the merchant marine act, 1928, known as the Jones-White Act."

Fuel Oil Bid Accepted

The bid of the Gulf Refining Company of Pittsburgh to supply the bunker oil requirements of the Merchant Fleet Corporation at the ports of New York, Philadelphia, New Orleans, Galveston and Port Arthur for the three-year period commencing January 1, 1929 was accepted by the Shipping Board on July 10. All other bids were rejected and the Fleet Corporation was authorized to re-invite bids for supplying requirements at Charleston, Savannah, Jacksonville, Tampa and Boston.

The contract is for the period of one year commencing January 1, 1929, and may be continued thereafter for two additional periods of one year each, provided only that nothing contained in the contract shall bind the Fleet Corporation in any fiscal year for the future payment of money in excess of appropriations made by Congress for the purpose of operating vessels under its control.

The contract with the Gulf Refining Company will be made on the following basis:

New York and Philadelphia for the three-year period, an average price of 92 cents per barrel, terminal delivery, and 97 cents per barrel, barge delivery.

New Orleans for the three-year period, an average fixed price of 86 cents per barrel terminal delivery, and 91 cents per barrel barge delivery.

Galveston for the three-year period, an average fixed price of 89 cents per barrel, terminal delivery, and 94 cents per barrel, barge delivery.

Port Arthur for the three-year period, an average fixed price of 84.33 cents per barrel, terminal delivery, and 89.33 cents per barrel, barge delivery.

The Fleet Corporation was also authorized to close with the Gulf Refining Company for its cargo requirements, which cover oil for its own bunkering stations, at a price of 79.33 cents per barrel, at Port Arthur.

All of these bids were accepted upon the basis of Fleet Corporation requirements up to the maximum amounts specified by the bidder with the understanding that the corporation is not obliged to take any minimum quantity.

The Fleet Corporation will act immediately to call for new bids at the ports which will not be supplied by this contract.

Ideas for Submarine Safety Devices Sought

The Secretary of the Navy has sent a message to all ships and stations of the Navy informing them of the appointment of a board of experts on submarine safety and salvage and inviting all persons in the naval service with ideas or suggestions that might facilitate the work of the board to submit them for consideration.

Secretary Wilbur defines the duties of the board as "To investigate and ascertain the methods and appliances adopted and used by the Navy in the operation of submarines to prevent collisions, to protect the lives of the officers and crews and to salvage vessels in case of disaster, and to make recommendations whereby these methods and appliances now in use may be changed and improved for the good of the naval service and the better protection of human life."

The members of the board are Thomas A. Scott, Dr. W. R. Whitney, Rear Admiral Joseph Strauss, (retired), Rear Admiral David W. Taylor (retired), and Dr. Samuel W. Stratton, president of the Massachusetts Institute of Technology and former director of the Bureau of Standards.

Plans for Merchant Marine Reserve

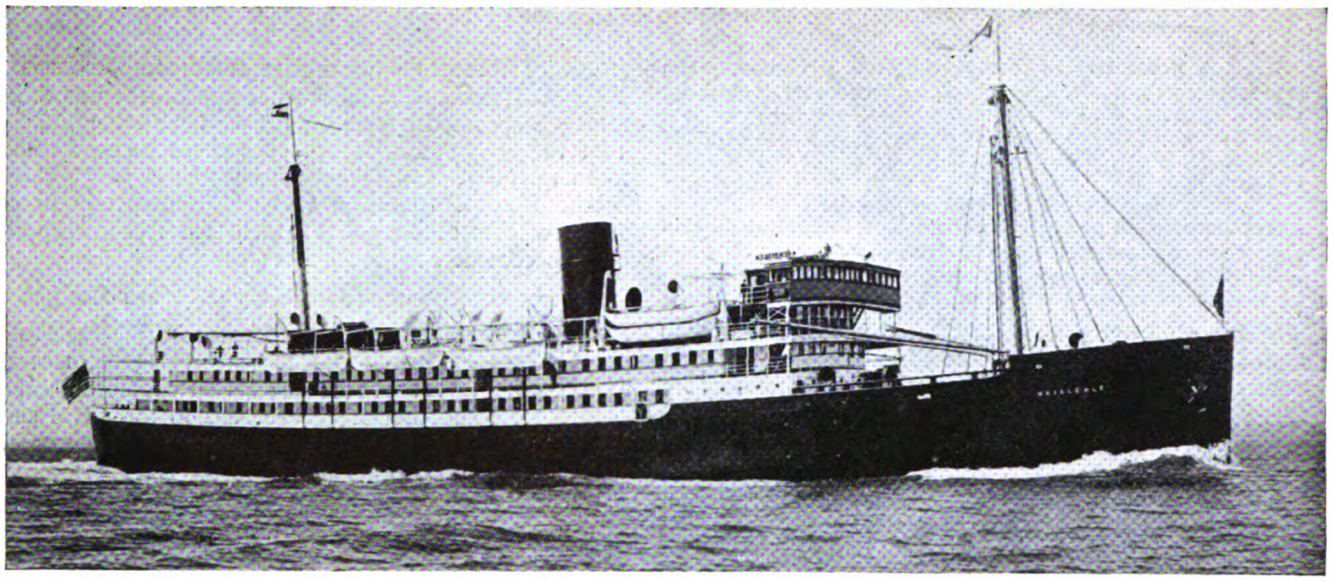
A board appointed by the Secretary of the Navy met at Washington on July 16 to examine the credentials and records of some 3,000 applicants for commissions in the merchant marine naval reserve, for the purpose of assigning rank and precedence to the successful candidates. The board consists of Captain J. V. Ogan, submarine specialist, Commander R. F. McConnell, Commander V. D. Chapline, Commander H. A. Jones, and Lieutenant L. C. McGlone.

The board is expected to submit its plans to Secretary Wilbur some time in August. Circulars have been sent out by the Bureau of Navigation soliciting applications for enlistment in the new reserve when it is organized and the applicants have been interviewed and investigated in the various naval districts. In addition the operators of steamship services have been requested to supply available information regarding the type of officers they employ and their prospective alinement with the reserve. It is planned to assign rank in the reserve commensurate with the rank and position an officer holds in the merchant marine and any experience in the Navy or Coast Guard will be given consideration. A large proportion of the applicants have had some naval experience.

The Bureau Veritas

THE Bureau Veritas, which is celebrating its one-hundredth anniversary this year, has issued an interesting booklet describing its origin, organization and functions. For many years the Bureau Veritas was the only ship classification society in the United States. In 1858 about 750 American vessels, aggregating 500,000 tons, were classed with the Bureau Veritas and at that time, and ever since, the Bureau Veritas Register was used as a basis for the compilation of statistics on marine vessels by the United States government.

Generated on 2024-09-12 14:15 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN



New Inter-Island passenger and freight steamer Waialeale

The Passenger Steamship Waialeale

Westinghouse geared turbines and electrical equipment installed on new steamship built for the Inter-Island Steam Navigation Company

WHEN the new $1,400,000 twin-screw passenger and freight steamship *Waialeale,* built at the Union Plant, San Francisco, Cal., of the Bethlehem Shipbuilding Corporation, Ltd., for the Inter-Island Steam Navigation Company, Honolulu, T. H., sailed on June 4 from San Francisco for the Hawaiian Islands to be placed in her regular trade, the event marked a definite advance in the construction of ships powered with geared turbines. Previous to her sailing the trial trip of this vessel indicated that the geared turbines installed were highly economical, regardless of the ship's speed; due to the turbine arrangement used.

Steamship officials aboard the ship during her trial run report that no vibration was felt during the entire trip and that the operation of the machinery was unusually quiet. By utilizing the auxiliary exhaust steam in the main turbines, the ship made better than her contract speed of 15 knots, using only the 1,600 shaft horsepower nozzles of each main turbine. At the normal rating of 4,000 shaft horsepower for the main turbines, the *Wailaleale* is expected to steam at a speed of more than 16 knots.

Principal Dimensions

The general particulars of the ship are:

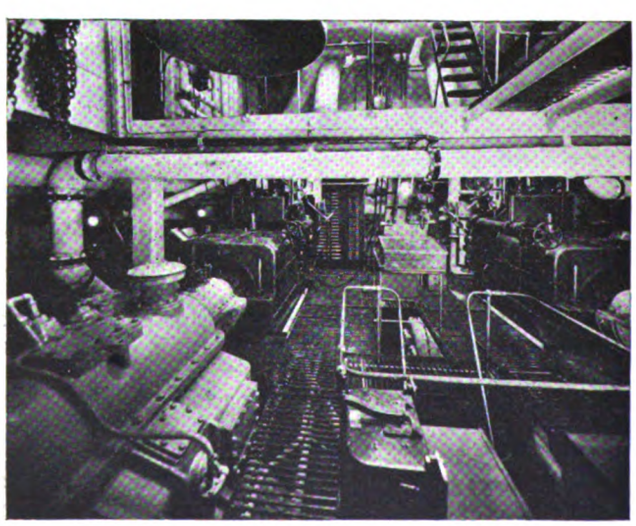
Length overall	310 feet	10 inches
Length between perpindiculars	295 feet	
Breadth molded	48 feet	
Depth molded to shelter deck	26 feet	6 inches
Draft	17 feet	4½ inches
Deadweight capacity	1,800 tons	

Accommodations are provided for 218 first class and 96 steerage passengers and a crew of 67. There are two continuous steel decks and the machinery is located amidships with watertight bulkheads surrounding the engine and boiler spaces.

The vessel will be used between Honolulu, Oahu and Hanemaula Bay on the Island of Kanal.

Westinghouse Geared Turbines Installed on Eleven Matson Vessels

The selection of geared turbine propelling machinery was decided upon by the Matson Navigation Company, who prepared the specifications in conjunction with the Inter-Island Navigation Company, owner of the vessel. The Matson Company has had an extended experience with geared turbines as they now operate eleven vessels equipped with this form of propulsion. These vessels have had very satisfactory operating records for reliability of machinery and economy, and inasmuch as



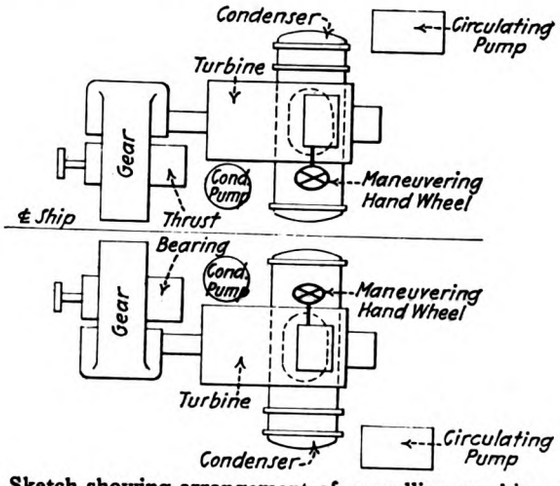
General view of engine room, looking forward

Generated on 2024-09-12 14:54 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

all of them have Westinghouse equipment, the Inter-Island Company decided to adopt the same make of propulsion equipment for the *Waialeale*.

The oldest of the Matson company's eleven vessels is the twin-screw steamer *Maui* which established a notable war record in the transport service and to date has logged well over 750,000 miles. The total mileage logged by all eleven of the geared turbine vessels, three of which are comparatively new acquisitions, is well over the 2,500,000 mile mark. The S. S. *Manulani* and the *Manukai*, with 5,500 shaft horsepower double reduction geared turbines, have a notable service record.

The new ship will operate, during the greater part of her run, on a schedule requiring a speed of 9½ to 10 knots. Part of the time she will be required to make 12 knots and at other times 14.3 knots. The builders



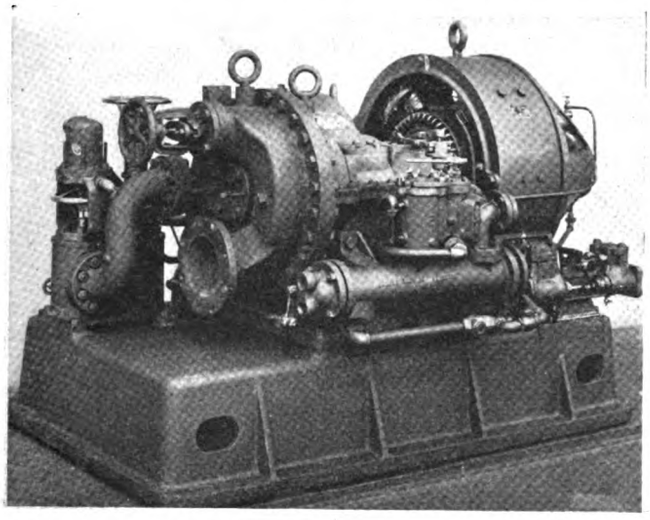
Sketch showing arrangement of propelling machinery

of the equipment arranged the ahead nozzles so as to provide the most efficient operation obtainable at the several speeds, which are as follows:

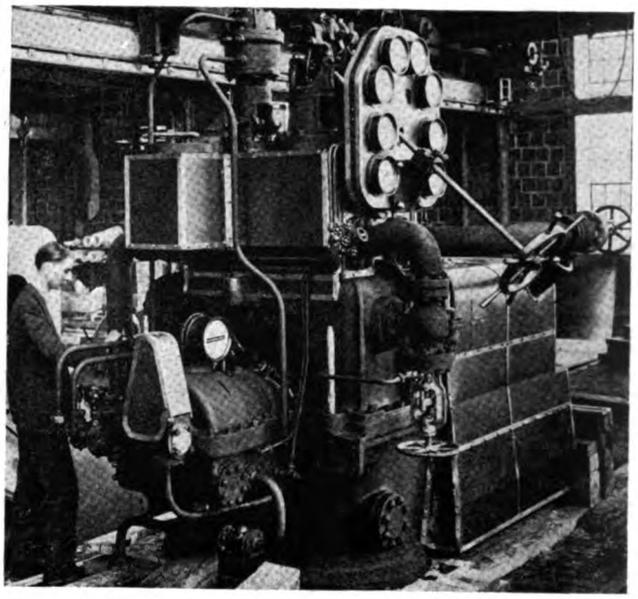
Knots	Total Shaft Horsepower	Shaft Horsepower per Shaft	Revolutions per Minute Turbine	Revolutions per Minute Propeller
10	700	350	2,270	85
12	1,320	660	2,720	102
14.3	2,400	1,200	3,220	121
15.9	4,000	2,000	3,600	135

Details of Propelling Machinery

The main propelling plant consists of two 2,000 shaft horsepower Westinghouse geared turbines, representing



One of the 94-kilowatt turbine generators



One of the two main 2,000-shaft-horsepower turbines

the builders' latest development in marine geared turbine design and construction.

The turbines are of the complete expansion, impulse reaction type with the cylinders conically bored for efficient expansion of the steam. The turbine exhaust flange is bolted solidly to the condenser inlet flange and the condenser serves as a support for the turbine at the exhaust end.

Each turbine is equipped with two ahead nozzles either or both of which may be opened as required by the operating conditions.

The first stage of the turbine consists of a two-row impulse wheel. This is followed by 21 pairs of rows of reaction blading. The reversing element, which is also a two-row impulse wheel, is located in the main exhaust chamber. All rotating impulse blades are made of stainless steel and the stationary impulse blades are cast of monel metal.

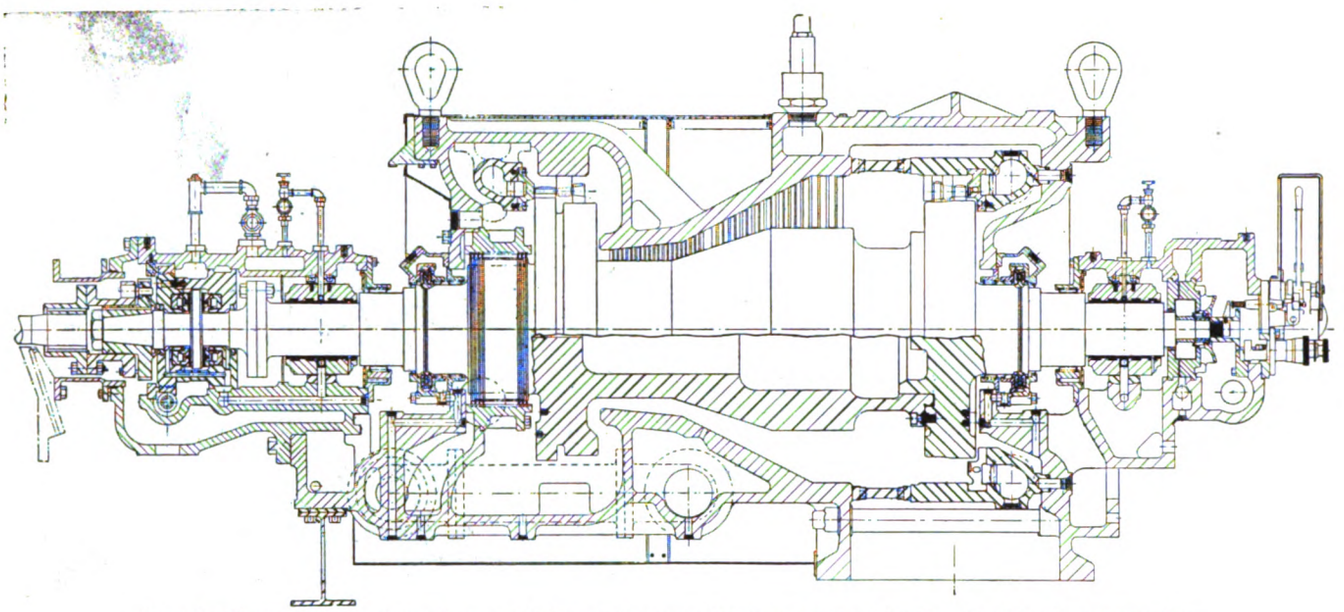
The turbine rotor is of the hollow drum construction and is made of forged steel in two parts. Both the astern and ahead impulse wheel are integral parts of the rotating element. This construction produces a very rigid rotor, in which the first critical speed is considerably above the normal operating speed. Axial thrust of the unit is partly counteracted by means of a balance dummy of the radial contact type, while the remainder of the thrust is absorbed by a thrust bearing.

Steam leakage from the cylinder, where the spindle extends through the casing at each end, is prevented by the use of combined steam and water seal glands. Both the steam and the water used by these glands may be controlled by either hand-operated valves or by an oil operated gland control valve which automatically admits steam or water according to the speed of the turbine.

Oil-Operated Governor

One of the notable features of design of these turbines is the employment of an oil-operated governor. This governor consists of an impeller mounted on the end of the turbine spindle, which, supplied from the gravity lubricating system, delivers oil to the governor valve operating cylinder relay at a pressure which varies as the square of the revolutions per minute. This relay controls the admission of high pressure oil to the governor valve operating cylinder. There is a

Generated on 2024-09-12 14:20 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN



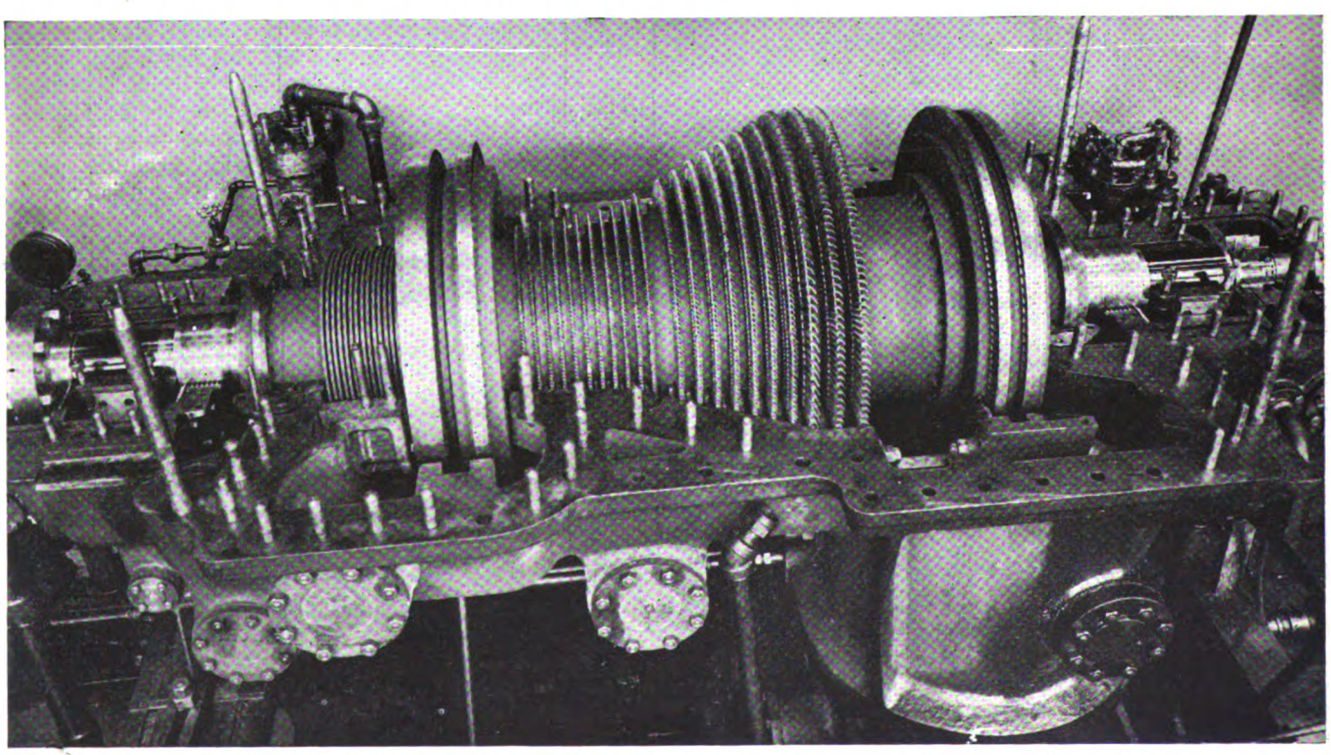
Longitudinal section through one of the main propelling turbines, showing details of construction

definite position of the governor valve for every speed. The governor may be adjusted by remote control, for any desired speed over a wide range, thus greatly lightening the burden of the watch engineer's duties in heavy weather. This governor has been demonstrated to be dependable in the highest degree and it is therefore unnecessary to provide the usual automatic overspeed stop.

Double Reduction Gears

The double reduction gears used with the turbines are also of Westinghouse make. They are of the flexible frame type, and of the usual double helical design with standard involute teeth. The high speed and the low speed pinions are each carried in two bearings mounted in a heavy frame flexibly supported on an I-beam to provide automatic equalization of pressure over the entire tooth face. These gears are connected to the turbine by means of flexible shafts and couplings. The gears are arranged in nearly a vertical plane, thus permitting the high speed pinion and the turbine to be placed high enough in the ship so that the condenser could be installed directly underneath the turbine. The high speed pinion is not placed directly above the slow speed gear but is located slightly outboard. This makes possible a considerable reduction in the overall length of the unit and, at the same time, permits the gear to be dismantled without disturbing the turbine.

The weight reaction of the turbine at the high pressure end is carried by a vertical I-beam support. The exhaust end is carried by the condenser which, in turn,



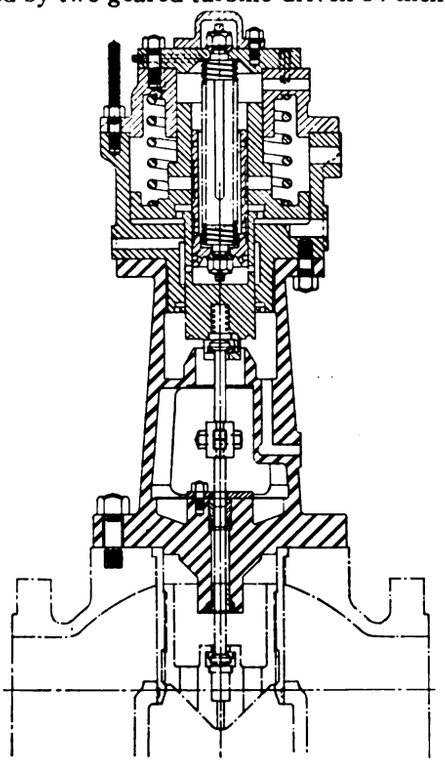
One of the 2,000-shaft-horsepower turbines with upper half of casing removed

Generated on 2024-09-12 14:16 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

is suspended at the top from a structural foundation. Hence any expansion of the condenser does not affect the turbine alinement.

Condenser Equipment

Both main and auxiliary condensers with their attendant auxiliaries were designed and built by the Westinghouse company. The two main condensers, each of which has 3,150 square feet of cooling surface, are of the two-pass surface type. The cooling water is supplied by two geared turbine-driven 14-inch centrifugal pumps, each of which has a capacity of 5,200 gallons per minute.



Section through oil-operated governor

Each main condenser is served by a motor-driven vertical condensate pump.

Two multi-stage high efficiency condensing type air ejectors mounted on inter and after surface condensers are used for removing the non-condensible vapors.

For auxiliary operation a 1,000-square foot surface condenser is provided.

Generators

Two generator sets manufactured by the Westinghouse Electric & Manufacturing Company are installed in the engine room. Each of these units consists of a single wheel impulse turbine geared to a 94 kilowatt direct current generator. The turbines are designed to operate with a steam pressure of 265 pounds per square inch, 75 degrees F. superheat and against 12 pounds gage back pressure. The generators deliver current at 125 volts for operating the ships' auxiliaries and also for lighting service.

Steam is supplied to the turbines by four Babcock & Wilcox watertube oil-burning boilers.

MONTHLY SHIPBUILDING REPORT.—The Bureau of Navigation, Department of Commerce, reports 185 steam, motor, sail and unrigged vessels of 18,428 gross tons built in the United States and officially numbered during the month of May, 1928.

Engineering Progress Shown by Waialeale's Turbines

By I. Short*

SOME of the more important advances that have been made in the design and construction of Westinghouse marine geared turbines during the past ten years are disclosed by comparing the photograph and drawing of one of the 2,000-shaft-horsepower main turbines of the S. S. *Waialeale,* reproduced on page 418 of this issue, with Figs. 1 and 2 on page 420, which show a turbine of approximately the same size which was built in 1918. Both are of the complete-expansion, impulse-reaction type, the ahead impulse blades being visible at the left on each rotor, the astern impulse blades at the right and the reaction blades in between.

Changes in Impulse Blading

It is at once evident that the *Waialeale* impulse blades are much more massive than those of the older type.

The chief advantage of this change is an improvement in overall turbine efficiency, but greater resistance to steam erosion is also secured. Given clean steam and good operating conditions, the new impulse blades should not require renewal during the life of the ship.

Furthermore, great mechanical strength in the impulse blades provides a very important factor of safety. It is possible to develop 50 percent of the normal power of an impulse-reaction type turbine from the impulse blades without the reaction blades, and several ships have made port under these conditions. Hence the modern turbine has been so designed that, in event of bearing failure or other possible accident, the impulse blades would survive the destruction of the reaction blades, thereby preserving enough of the mechanism to make it possible for the ship to continue under her own power.

The *Waialeale's* rotor shows two rows of astern impulse blades in place of the single row with a steam-flow reversing chamber used on the 1918 type. This change is likewise in the direction of greater reliability and efficiency.

The Reaction Blading

The most striking feature of the *Waialeale's* reaction blades, as compared with those of the older model, is the uniform manner in which they increase in diameter. In other words, the *Waialeale's* cylinder and reaction blading have been machined "conically", whereas earlier practice was to use a "stepped", or "barrel" design.

Obviously, a much smoother and more regular steam passage is provided by the newer form and among its practical results are the elimination of steam eddies and water pockets, better steam expansion and materially improved efficiency, without in any way sacrificing reliability.

Conspicuous in the actual turbine but discernible even in the photograph is the silvery lustre of the *Waialeale's* blades. This is due to the use of stainless steel which, as shown by several years of research, imparts greater strength to the blades, improves their wearing qualities and retards depreciation of their efficiency. It also permits the use of high-pressure-and-temperature steam, which is becoming general with land turbines and will, doubtlessly, in time be employed at sea. Manganese-copper, the earlier standard material for reaction blades, is now no longer used.

* Marine engineer, Westinghouse Electric & Mfg. Company, South Philadelphia Works.

Generated on 2024-09-12 15:01 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

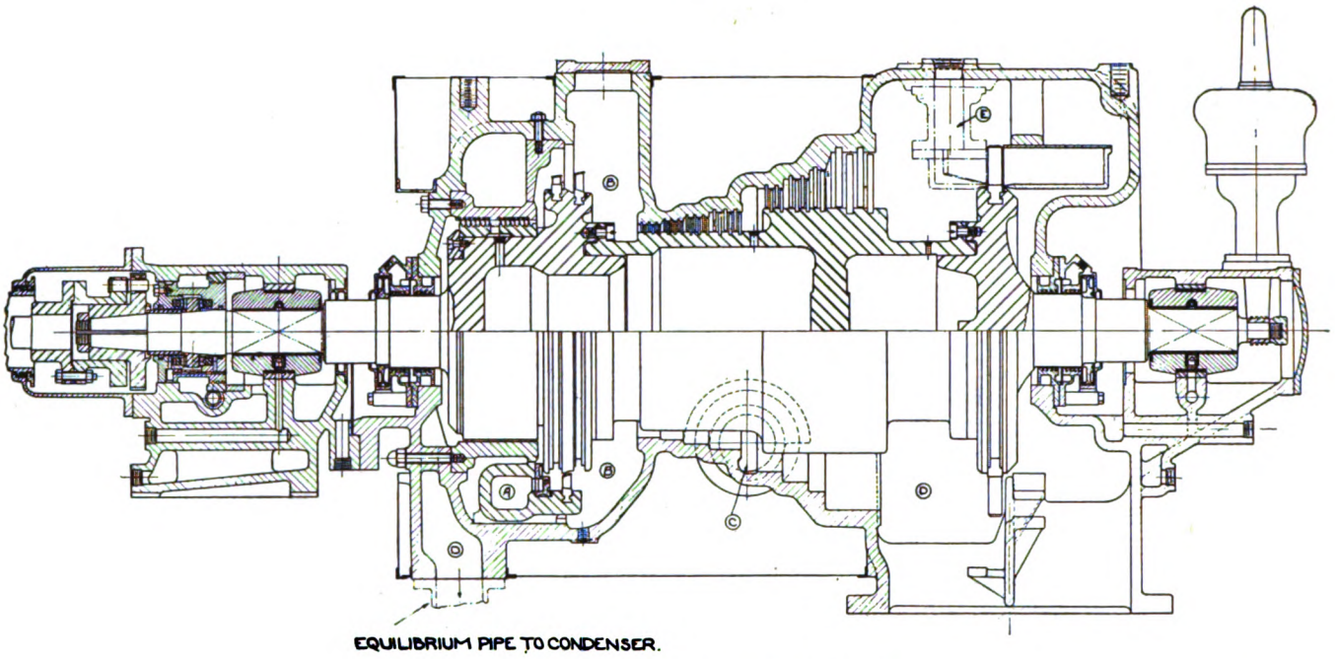


Fig. 1.—Longitudinal section of the 1918 turbine

At the extreme right end of the shaft of the *Waialeale's* spindle, a small impeller can be seen which is a part of a newly developed governor. It rotates in a chamber filled with oil, and as it imparts a pressure to the oil which is a function of the turbine's speed, this pressure is used to control the steam supply to the turbine.

The mechanism of this governor is very simple. Fly balls, knife edges and parts in contact with steam are done away with; there is nothing that can wear or is liable to stick and nothing that rotates aft the impeller. It can be set to operate the turbine at any speed from 25 percent to maximum; the setting can be changed at will and by remote control, if desired; and the speed variation

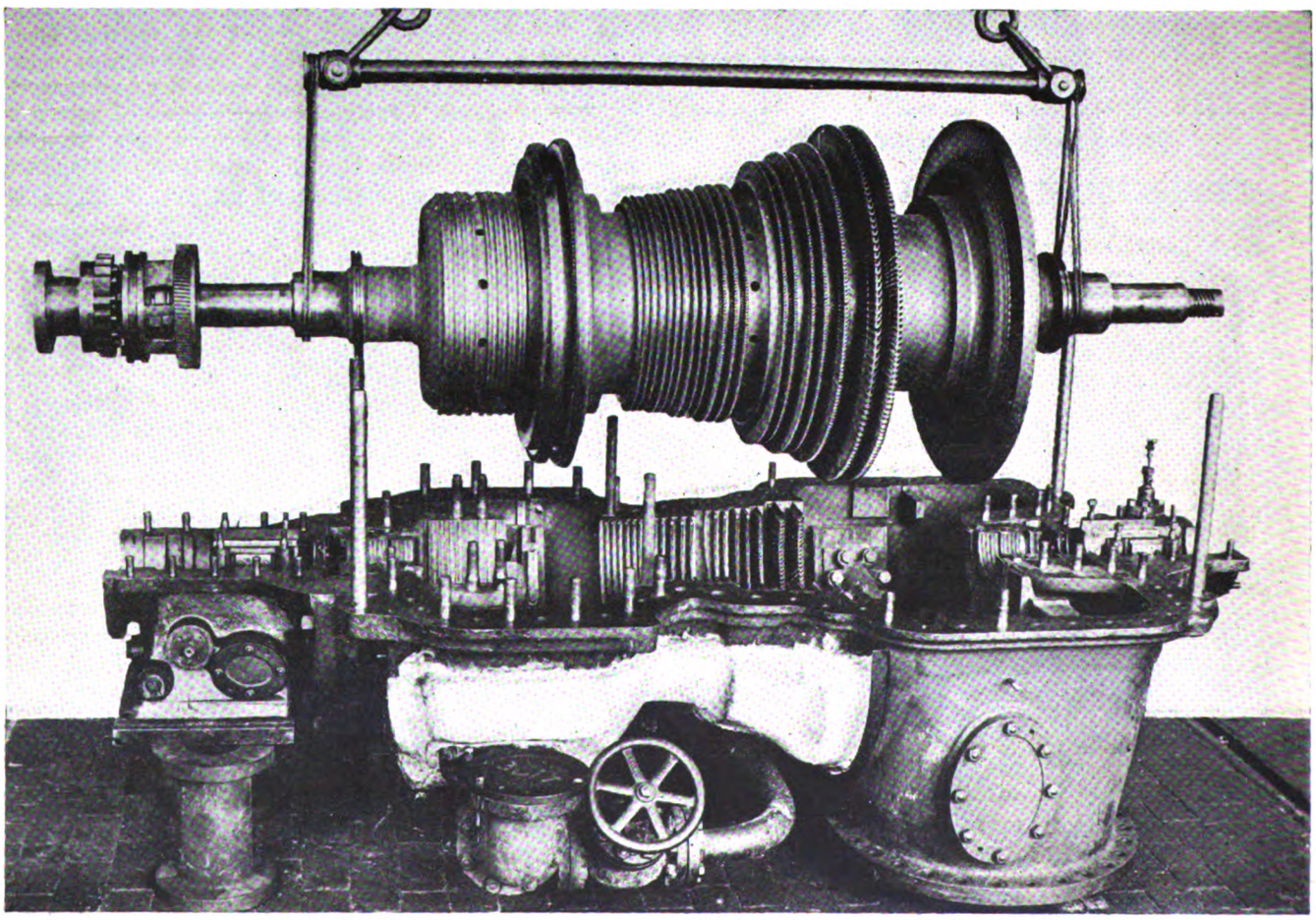


Fig. 2.—A 1,500-shaft-horsepower Westinghouse marine geared turbine built in 1918

Generated on 2024-09-12 15:01 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

from the set value will not exceed 5 percent. So sensitive and positive has this governor proved in practice, that automatic overspeed trip is omitted as no longer useful.

Other Improvements

Among other recent improvements found in the *Waialeale's* turbine are:

The spindle is constructed of two pieces of forged steel instead of three steel castings.

The grooves of the dummy piston are cut very deep to allow for thermal distortion.

The coupling end of the turbine is supported on a flexible I-beam instead of upon sliding gibs which may rust and stick and cause buckling when the turbine expands on being warmed up.

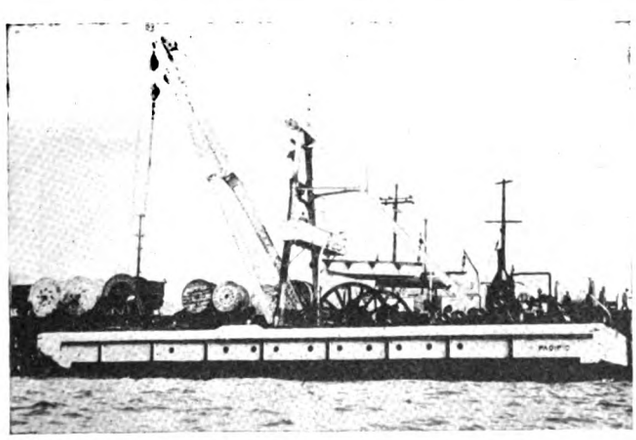
The water-gland ring is made of two pieces bolted together and easily renewable, in place of a solid piece shrunk on the shaft and renewable only by the removal of the spindle.

It is evident, therefore, that considerable progress has been made in marine turbine engineering during the past decade, and that the modern turbine is both more efficient and more reliable than the type of ten years ago.

Its efficiency has, in fact, been raised to the point where its operating cost should be, in general, equal to, if not less than, that of any other comparable unit for ship propulsion. With proper attention it can be depended upon to last as long as the ship it drives without major repairs.

Ellis Channel Barges Built on the Pacific Coast

THREE large barges have recently been built under the Ellis channel system of steel hull construction on the Pacific coast. The largest, costing approximately $100,000, is the cable barge *Pacific*, of the Pacific Telephone & Telegraph Company, of San Francisco, and will be used in laying, maintaining and repairing submarine telephone and telegraph cables in San Francisco harbor and elsewhere on the Pacific coast. The other two barges are for the Kamchatka Company, a Soviet Government organization, and will be used as fish carriers in Siberia, having been shipped to their destination in sections.



Cable barge for the Pacific Telephone and Telegraph Company

The Pacific Telephone & Telegraph Company Barge, measuring 100 feet by 40 feet by 12 feet, is built entirely of 12-inch structural channel steel, riveted edge to edge. This barge has been equipped with a 25-ton derrick, and a cable reel which will hold 15,000 feet of four-inch cable, both of which are driven by steam. She has an electric light plant and an electric arc welding plant aboard. Accommodations are also provided for from 35 to 40 men, including a galley and mess room.

Diesel-Electric Towboat for Warrior River

THE Tennessee Coal, Iron and Railroad Company, Birmingham, Ala., a subsidiary of the United States Steel Corporation, is having built a electric towboat of the twin-screw, tunnel stern type. The steel hull and superstructure are being built by the American Bridge Company, at their Ambridge plant, Ambridge, Pa. The outfitting work will be done by the Carnegie Steel Company, at their plant in Clairton, Pa.

The towboat will be of the following molded dimensions:

Length	140 feet
Breadth	25 feet
Depth	9 feet 3 inches

These dimensions were fixed by the size of the locks on the Warrior and Tombigbee Rivers on which the boat will operate. The locks are of such size that they can take a tow 280 feet long by 50 feet wide, and as the towboat will at times handle seven barges of standard size, 140 feet by 25 feet, in each tow, the entire fleet will be enabled to pass through a lock in two lockages.

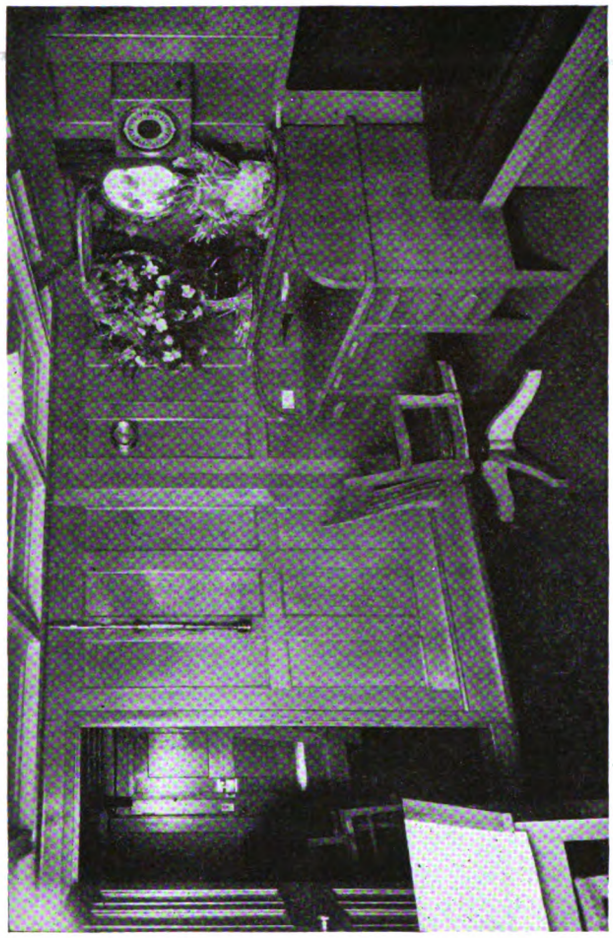
The boat will operate between Birmingport, near Birmingham, Ala., and Mobile, a total river distance of 419 miles. It will have to pass through 17 locks, one of which is the double type, requiring two lockages. A portion of the Warrior River, which passes through the alluvial district, has a number of sharp bends and at times a swift current. It is the belief that a Diesel-electric towboat will give maximum efficiency and maneuvering ability for handling a tow in a river of this nature.

This boat has been designed to give the maximum comfort and accommodations for the crew, and when completed it will be one of the most modern and up-to-date towboats operating on any river in this country.

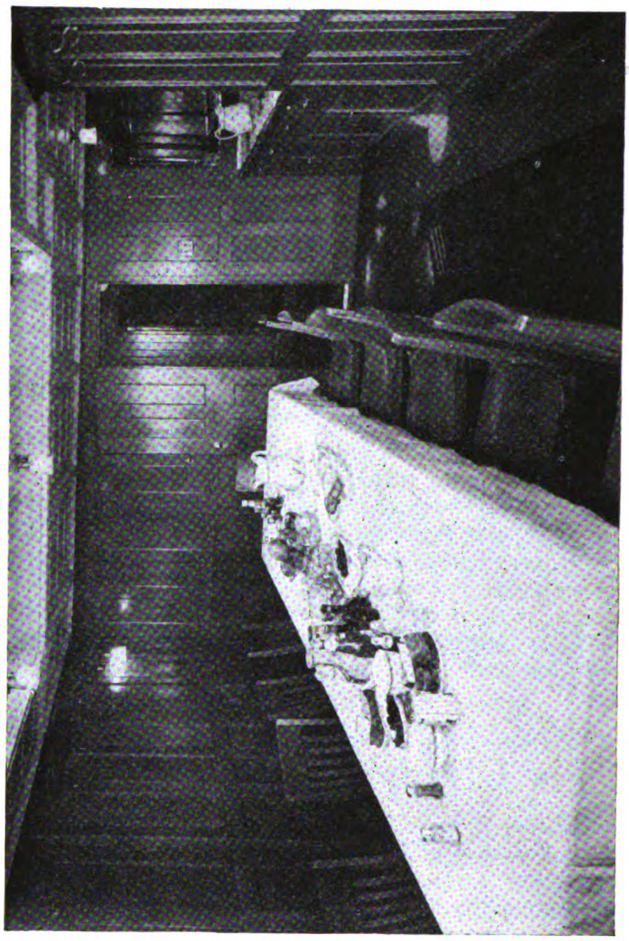
The vessel will be electrically equipped, with the exception of the galley and the heating facilities, the latter being provided by a small donkey boiler, which will also furnish steam for syphoning the barges when necessary. The power plant consists of two 550-horsepower Nelseco Diesel engines, manufactured by the New London Ship & Engine Company, Groton, Conn., direct connected to two 335-kilowatt, 250-volt, 250-revolutions per minute, direct-current generators. Each propeller, of 7 feet 3 inches diameter, will be driven by a double motor, rated 400 horse-power, 140 revolutions per minute, 250-volts, shunt wound. Power for the auxiliaries and lighting, as well as for excitation for the main generators and propelling motors, will be furnished by two 40-kilowatt, 120-volt, compound-wound, direct current, auxiliary generators. These will be driven by the main engines and will be mounted directly on shaft extensions of the main generators. Variable voltage control will be used, arranged for operation either from the pilot house or the engine room.

It is expected that the boat will be put in service about the end of the present year.

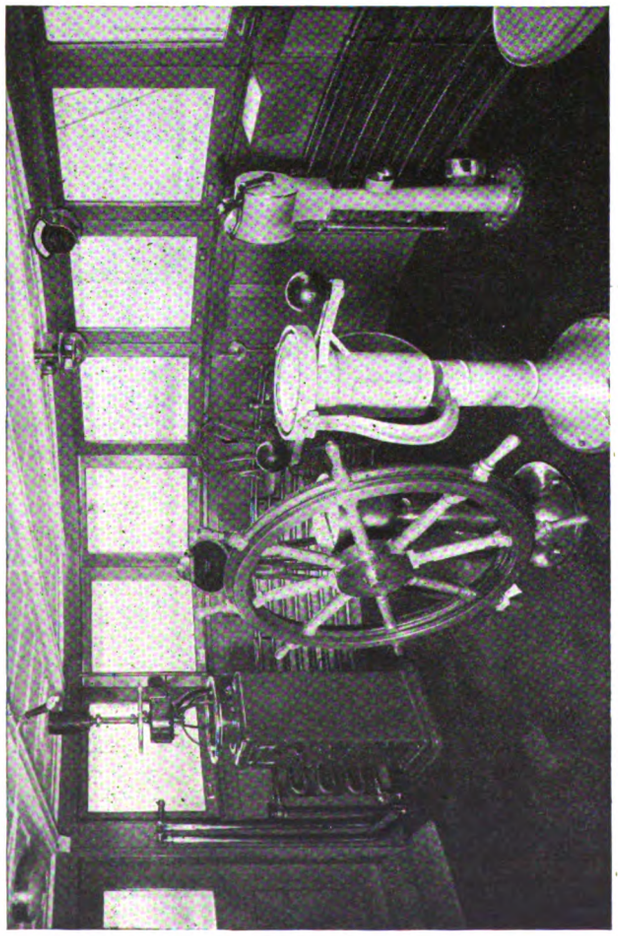
Generated on 2024-09-12 14:15 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN



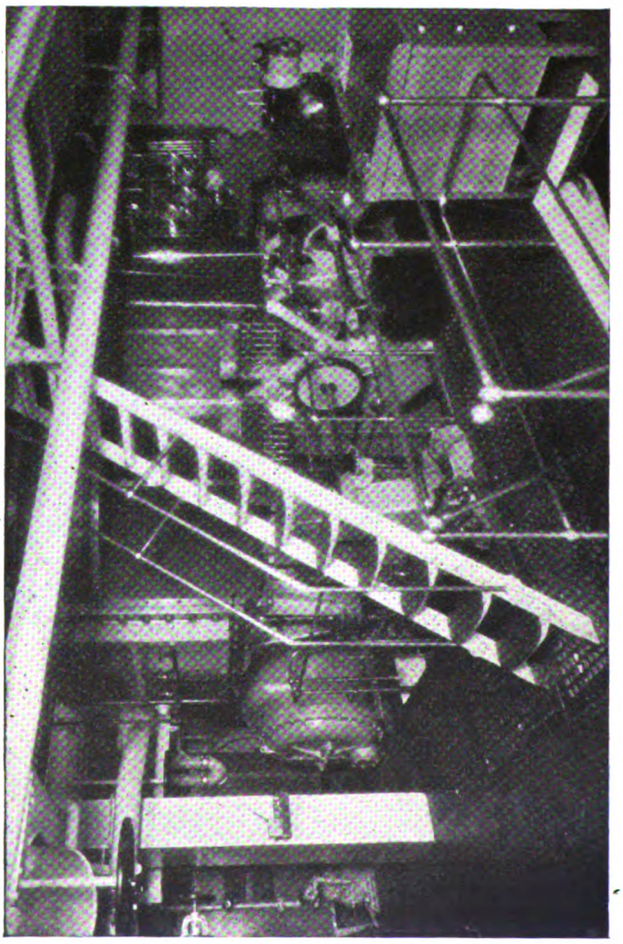
Captain's office



Officers' dining room



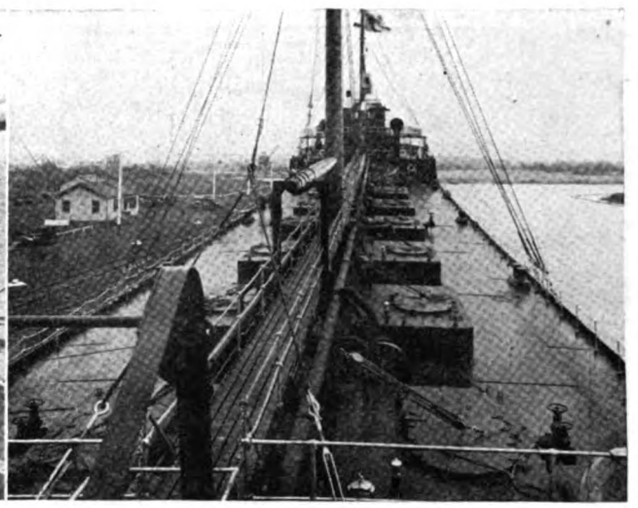
Pilot house



Operating platform, looking to port

Generated on 2024-09-12 14:20 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

Deck view looking aft



Deck view looking forward

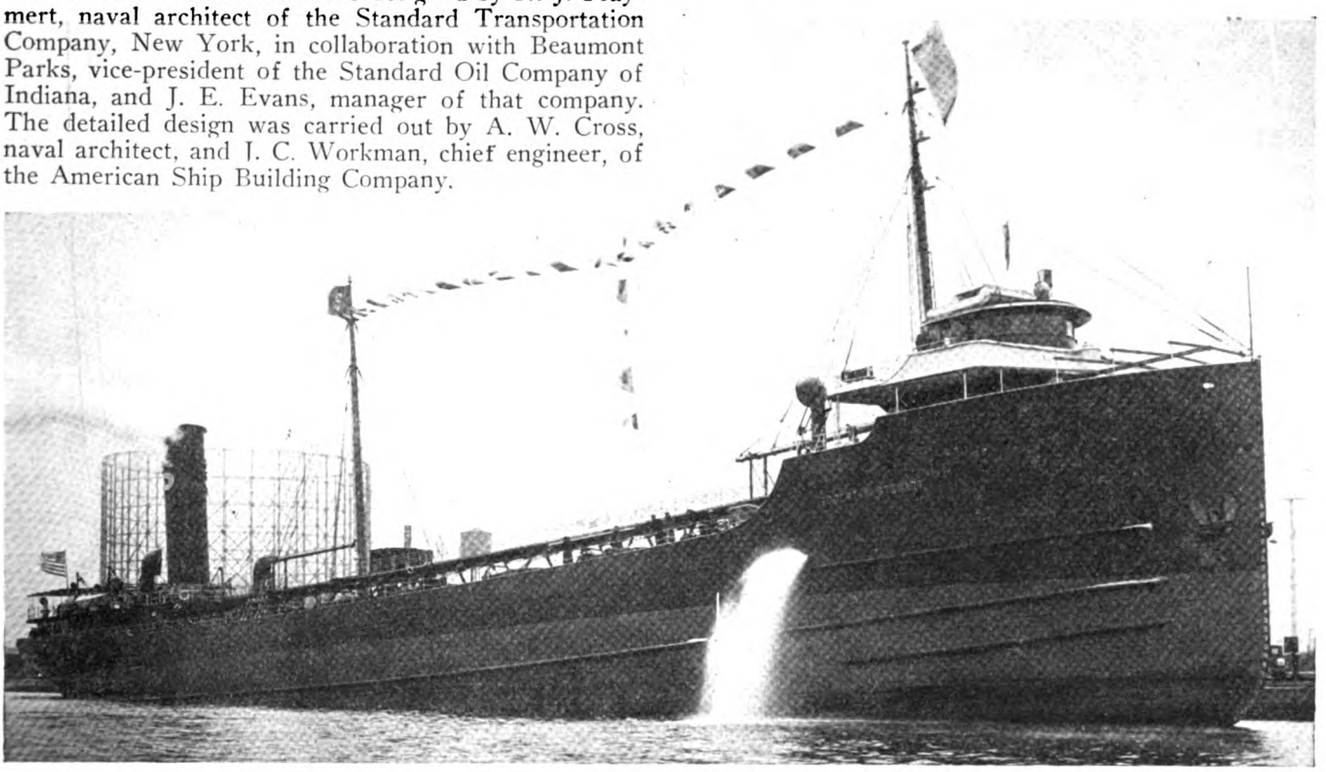
Standard Oil Tanker Robert W. Stewart

Second largest tanker on Great Lakes has capacity of 2,000,000 gallons—Was built by the American Ship Building Company

THE second largest tanker in service on the Great Lakes, and the only one of any considerable size built since 1918, was placed in service recently by the Standard Oil Company of Indiana with main offices at Whiting, Ind. This vessel, the *Robert W. Stewart,* was completed in seven months from the time the keel was laid at the Lorain, Ohio, yards of the American Ship Building Company, Cleveland, Ohio. Delivery to the owners was made April 7 after acceptance trials had been conducted on the vessel.

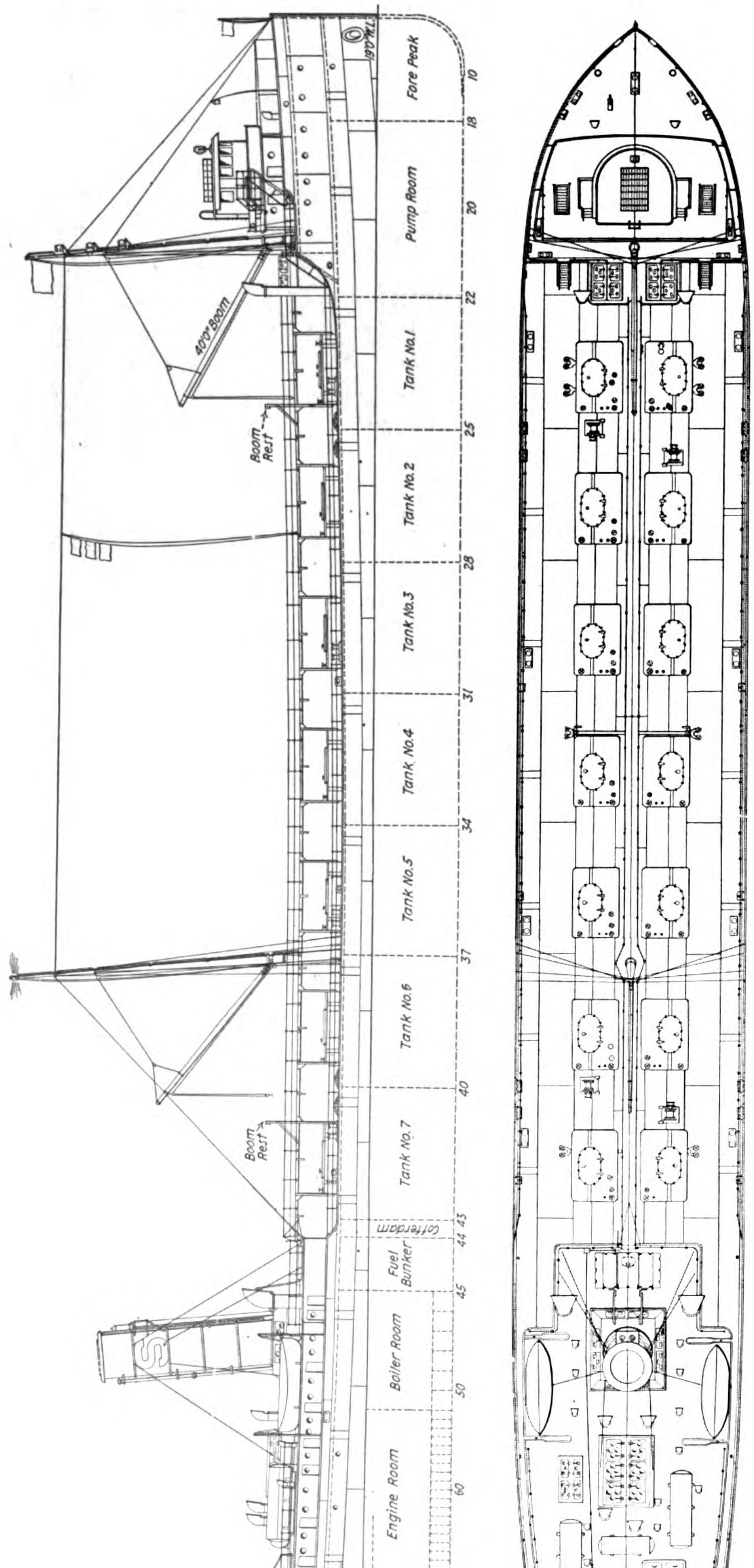
The *Robert W. Stewart* was designed by N. J. Pluymert, naval architect of the Standard Transportation Company, New York, in collaboration with Beaumont Parks, vice-president of the Standard Oil Company of Indiana, and J. E. Evans, manager of that company. The detailed design was carried out by A. W. Cross, naval architect, and J. C. Workman, chief engineer, of the American Ship Building Company.

In general, the vessel follows conventional Great Lakes tanker design, great care, however, having been given to details of construction by the shipyard, so that the *Robert W. Stewart* as a finished product of the shipbuilder's art is on a par with the finest vessels of the type built in American yards. With the exception of certain auxiliaries and miscellaneous equipment, the ship was turned out complete by the American Ship Building Company, the hull, main engines, boilers, windlass, steering gear, warping winches, all being built by the

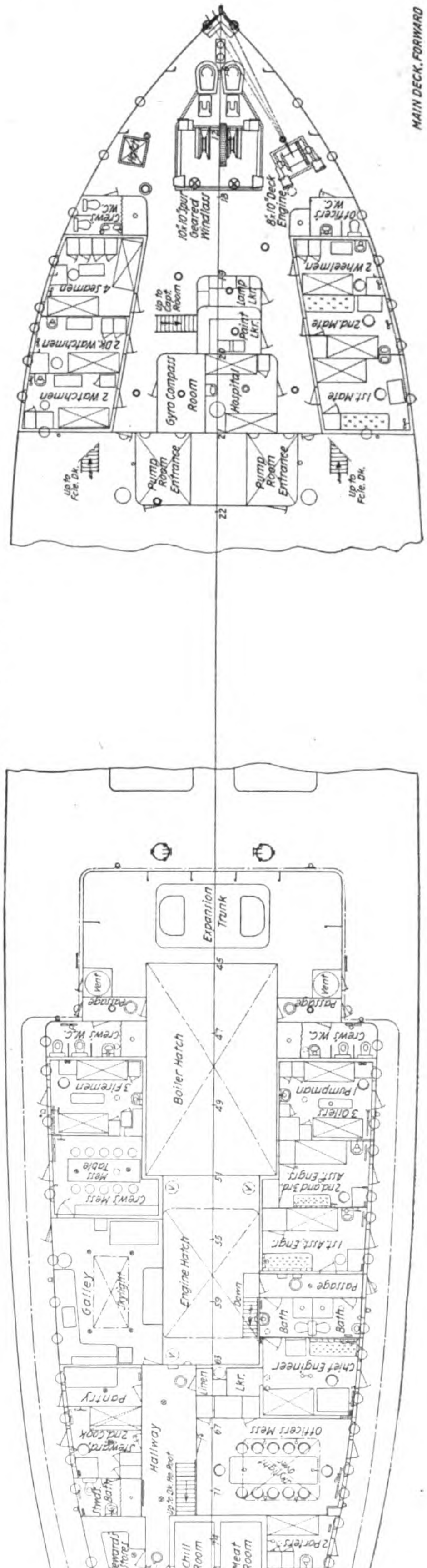


S. S. Robert W. Stewart, the second largest tanker on the Great Lakes. Built by the American Shipbuilding Company for the Standard Oil Company of Indiana

Generated on 2024-09-12 14:14 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN



General arrangement plans of tanker Robert W. Stewart



Enlarged plan of accommodations

Generated on 2024-09-12 14:14 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google

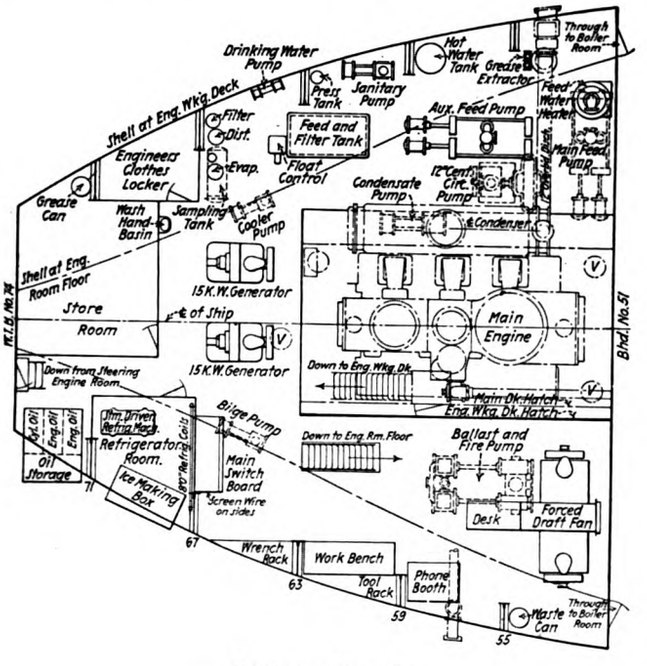
Digitized by Google

Original from UNIVERSITY OF MICHIGAN

yard. The dimensions of the vessel are as follows:

Length overall	390 feet 5 inches
Length between perpendiculars	380 feet 3 inches
Beam, molded	52 feet
Depth, molded	25 feet
Block coefficient	0.82
Load draft	19 feet
Indicated horsepower	2,490
Speed (M. P. H.)	13.22
Cargo capacity (gallons)	2,071,780
Fuel oil capacity (gallons)	114,825
Displacement	8,885 tons

The hull is built on the Isherwood system of longitudinal framing under the highest classification of the American Bureau of Shipping for Great Lakes tankers. Oil-tight bulkheads subdivide the hull into 7 double main cargo tanks each 30 feet in length. In addition bulkhead subdivisions provide a forepeak and a pump room forward of the main cargo tanks while two cofferdams aft separate No. 7 cargo tank from the fuel bunker and



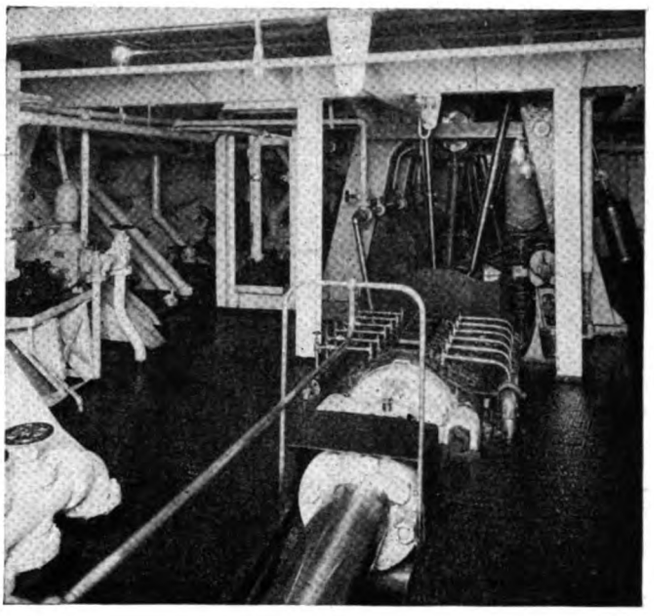
Engine room plan

machinery spaces. The fuel bunkers have a capacity of 2,297 barrels of oil. No double bottom has been provided in the hull in the cargo space so that from the stem to the after bulkhead of the fuel bunker compartments the cargo is carried down to the bottom.

Accommodations for Officers and Crew

Following the customary practice on the Great Lakes, the bridge, pilot house, captain's quarters, deck officers' quarters and deck crew quarters are all located forward in the texas on the forecastle deck. The machinery is located aft while the engineer officers and crew quarters, officers' and crew's mess, galley, refrigerated store space, provision compartments and other accommodations are located in the after deck house.

The captain's office and living quarters include a bedroom and bath and a spare stateroom fitted in a steel deckhouse forward on which the pilot house is erected. These rooms are all finished in quartered white oak panelling. In the after deck house the accommodations, including the galley, pantry and mess room, are finished in cypress panelling. The officers' mess room



Engine room, looking forward

as well as the chief engineer's stateroom are finished in quartered white oak panelling. All remaining accommodations for the crew, including living rooms and quarters, are finished in tongued-and-grooved yellow pine staving. Overhead, all rooms are paneled in cypress. Between the ceiling panels and the deck a 3-inch dead air space is provided, while for quarters adjacent to the boiler and engine room casings a 2-inch dead air and 2-inch block cork insulation separates the panelling from the steel bulkheads.

The profile of the tanker, as indicated by the illustrations, presents a typical lake-tanker appearance having two steel pole masts with the stack aft and with the customary gangway extending fore and aft along the centerline of the vessel from the forecastle to the after deck house. Expansion trunks are provided for each cargo tank. A special vapor-pressure valve of the owners' design is provided for each tank, special care having been taken throughout the construction of the vessel to avoid the possibility of sparks. Each of the masts is fitted with a 40-foot boom for handling stores, odd cargo and suction hose.

Propelling Machinery

The main propelling machinery consists of one vertical, triple-expansion steam engine having cylinders 23½, 38 and 63 inches in diameter with a stroke of 42 inches. This engine was designed and built by the American Ship Building Company. The engine is fitted with double-ported slide valves with relief frames which admit steam to both the intermediate and low pressure cylinders. Lovekin assistant cylinders are connected to the cylinder valves while the Stephenson double-bar link of the overhung type is used for operating all valve gears. The engine is equipped with a 4½ by 5-inch turning engine and a 12 by 20-inch reversing engine.

Steam is furnished at a working pressure of 180 pounds per square inch by two single-ended Scotch marine boilers, each 15 feet 4½ inches in diameter and 11 feet 6 inches long inside of the heads. Each boiler is fitted with three 46-inch inside diameter Morison suspension furnaces. The boilers operate under Howden's system of forced draft and have a total heating surface of 4,234 square feet. They were built by the American

Generated on 2024-09-12 15:00 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

Ship Building Company at the Lorain plant and are fitted with Todd oil burners. Howden air heaters, having 2,760 square feet of heating surface, are fitted. The forced draft fan, of the American Blower type, with a capacity of 20,000 cubic feet per minute, is driven by two engines. The boilers are fitted with Bennett flue blowers, and a Reilly feed water heater is provided.

The vessel is driven by a single 4-bladed cast iron propeller of the sectional type having a diameter of 14 feet 10 inches and a pitch of 14 feet 4 inches.

Auxiliaries

The auxiliaries, with the exception of a few items, and the cargo pumps were built by the American Ship inches by 11 inches by 18 inches. In addition, there is one 7-inch by 6-inch by 10-inch duplex transfer pump located in the forward pump room and a 6-inch by 4-inch by 6-inch duplex bilge pump. Ventilation in the forward pump room is provided by an American Blower Company fan, driven by a reciprocating steam engine, which has a capacity of about 9,000 cubic feet of free air per minute.

A 16-inch by 10-inch by 14-inch duplex type ballast and fire pump is located in the engine room. The main feed pump is also of the duplex type, 12 inches by 7 inches by 12 inches. The auxiliary feed pump is of the same size and type. In addition, there are two Metropolitan double-tube 2-inch injectors. The remaining

Table I—Trial Data, S.S. Robert W. Stewart, April 4, 1928

								Cylinders								Temperatures						Press.		Fuel Oil			
								H.P		I.P.		L.P.															
Test No.	Time	Revs.	Boiler Pressure	H. P. Recvr.	I. P. Recvr.	L. P. Recvr.	Vacuum	Cut	I.H.P.	Cut	I.H.P.	Cut	I.H.P.	Total I.H.P.	Sea Suct.	Ovbo. Disc.	E. & F. Tank	Boiler Feed	Stack	Eng. Rm. at Fan	Oil Disch.	Air at Fan	Air at Furn.	Oil Press.	No. of Tips	Size of Tips	Meter Reading Gall.
1	9.30	90.5	175	162	57	15.5	23¼	70.5	649	70	625	58½	894	2168	38	95	85	168	275	81	75°	1½	.4	125	6	86	46,990
2	10.30	94¼	165	160	65	14¾	24½	77,7	667	74	752	61½	993	2411	38	92	84	178	360	80	75	1¼	.6	125	6	86	47,260
3	11.30	97.5	175	168	65	15	23	77	617	72	848	63¼	1124	2689	37	118	140	220	400	82	75	1¼	.5	135	6	86	47,680
4	12.00	97.5	175	168	65	15	24¼	77	725	72	813	63¼	1092	2630	37	108	121	211	410	80	70	1⅞	.5	135	6	86	47,930
5	12.30	95.5	175	168	65	15.5	24¼	77	690	72	859	63¼	1211	2760	38	110	113	210	360	79	70	2	.4	130	6	86	48,120
6	12.45	94	175	165	58	14	24½	72 2/3	846	69	692	58	1068	2606	38	104	110	224	320	78	75	2	.4	130	6	86	48,260
7	1.15	95	172	161	62	14½	24½	72 2/3	687	69	714	58	1111	2512	38	105	114	208	350	79	75	1¼	.4	115	6	86	48,400
8	1.45	96	175	162	62	14½	24¼	72 2/3	701	69	726	58	1138	2565	38	107	120	210	350	80	75	1½	.5	115	6	86	48,600
9	2.15	96	175	162	62	14½	24	72 2/3	686	69	726	58	1096	2408	38	107	120	210	350	77	75	1½	.4	100	6	86	48,750
10	2.45	95	175	162	62	14½	24¼	77 2/3	683	69	724	58	1025	2432	38	117	120	210	355	78	75	1½	.3½	95	6	86	48,920
11	3.15	96	175	163	60	15	24	72 2/3	690	69	715	58	1075	2480	38	106	120	210	360	78	75	1½	.4	100	6	86	49,120
12	3.30	95	175	160	60	14¾	25	72 2/3	698	69	707	58	1025	2430	38	105	120	217	350	78	75	1½	.4	100	6	86	49,200
Average		95+	175−	162	61	14½	24.3	72 2/3	713	69	715	58	1078	2490	38	107	118	212	348	78	75	1.6	.4+	107	6		341.4

AUXILIARIES AND NOTES

No.	Unit	Size	Type	Stm. Per Hr. & Press	Notes	Figures Given are for Average Steam Consumption
1	Main Fd. Pump	7x7 Eng.	Duplex	866 lbs. @ 175	11" stroke	Per Hour, for Tests No. 6, 7, 8, 9, 10, 11 & 12.
1	15 K. W. Gen'tor.	12x7x12	Simplex	1732 " @ 115		Average Room Temperature at Fan Intake 78°
1	Sanitary Pump	6x4x6	Duplex	54 " @ 115		Average Back Press.—5 Lbs.
1	Condensate Pump	7x7x10	Duplex	186 " @ 115	9½" stroke	
1	Tail Pump	9x9 Eng.	Simplex	1633 " @ 115		
1	Fan Eng.	7x7 Eng.	Simplex	1451 " @ 115		
1	Bilge Pump	6x6x6	Duplex	288 " @ 115		
1	Refrig. Eng.		Simplex	150 " @ 115		
1	Steer. Eng.	9x9	Duplex	350 " @ 80		
1	Fuel Oil Pump	6x4x6	Duplex	200 " @ 115		
1	Jet Air Pump			350 " @ 170		
	Radiation, Etc.			206 "		
			Total	= 7,466		

Table II—Results from Indicator Cards Taken on Trial Trip April 4, 1928

	Horsepowers					M. R. P. Ref. to	% of Work		
Card No.	H. P. Cyl.	I. P. Cyl.	L. P. Cyl.	Total	R. P. M.	L. P. Cyl.	H. P. Cyl.	I. P. Cyl.	L. P. Cyl.
1	648.560	625.200	894.320	2,168.080	90.5	34.4	29.9	28.9	41.2
2	667.070	751.950	993.460	2,411.480	94.25	38.6	27.7	31.2	41.1
3	617.273	847.552	1,124.080	2,587.905	97.5	44.6	23.9	32.8	43.3
4	725.015	812.721	1,091.960	2,629.696	97.5	40.8	26.6	30.9	42.5
5	689.790	858.597	1,211.120	2,759.517	95.5	43.7	25.0	31.2	43.8
6	845.510	692.402	1,068.250	2,606.122	94	42.0	32.4	26.6	41.0
7	687.267	713.876	1,110.900	2,512.043	95	40.0	27.8	28.5	43.7
8	700.952	725.911	1,138.410	2,565.273	96	40.5	27.4	28.3	44.3
9	685.901	725.911	1,095.720	2,507.532	96	38.1	27.4	29.0	43.6
10	683,011	724,007	1,024.850	2,431,868	95	39.7	28.1	29.8	42.1
11	690.000	714.810	1,074.670	2,479.480	96	39.2	27.8	28.9	43.3
12	697.906	707.039	1,024.870	2,429.815	95	38.6	28.7	29.1	42.2

Building Company. The main condenser, which has 2,700 square feet of cooling surface, was supplied by the Foster-Wheeler Corporation, New York, the vacuum being maintained by two steam jet air pumps and a condensate pump of the duplex type 7 inches by 7 inches by 10 inches. A 12-inch centrifugal pump, made by the Morris Machine Works and driven by a 9 by 9-inch engine, is utilized to circulate condenser cooling water.

In the cargo pump room are located two National Transit Company steam driven duplex cargo pumps, 15 pump equipment includes a 6-inch by 6-inch by 6-inch horizontal duplex sanitary water pump and a 3-inch by 2-inch by 4-inch duplex type drinking water pump.

The vessel is also equipped with a Griscom-Russell distilling apparatus consisting of an evaporator, distiller and filter having a capacity of 50 gallons per hour. Two 15-kilowatt, 115-volt, direct current Engberg generators direct connected to Engberg reciprocating steam engines supply electricity for light and other purposes. Refrigeration to an insulated meat and vegetable room is

Generated on 2024-09-12 14:15 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

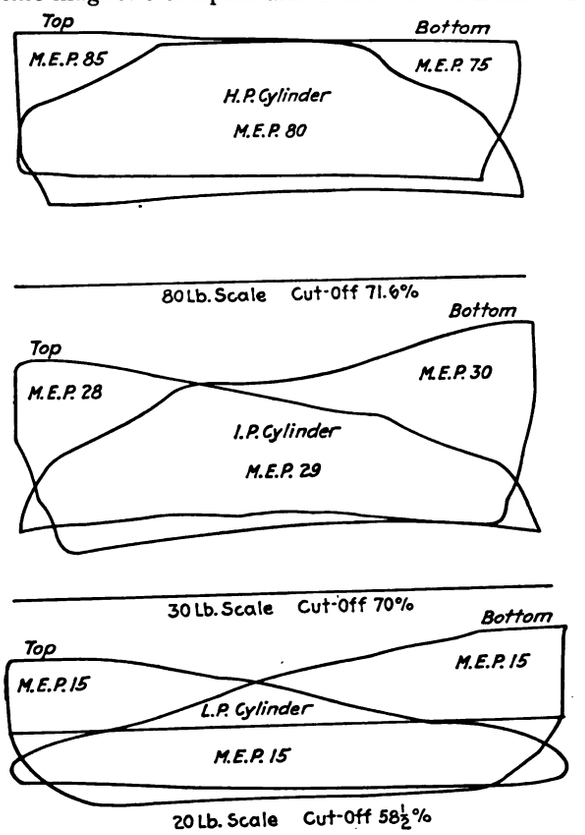
supplied by a 2-ton Brunswick-Kroeschell steam-driven refrigerating machine.

The deck machinery includes six 8 by 10-inch duplex mooring winches made by the American Ship Building Company, one of which is located in the windlass room, four on the upper deck and one aft in the fantail.

The steering gear, which is operated by hand and steam aft and by steam forward through steel shaft and roller bearing and bevel gear transmission to the pilot house, is of the American Ship Building Company's direct geared duplex type, 9 inches by 9 inches. The windlass, which is of the spur geared type, 10 inches by 10 inches, was also built by the shipyard. Naco anchor chain, 2 1/8 inches in diameter, is used on the vessel.

The navigating equipment includes a Kolster radio compass, a Sperry course recorder, a McNab revolution indicator, a Sperry gyro compass with two repeaters, a Ritchie magnetic compass and a Morrison binnacle. The engine room signals and a telephone system, of Cory manufacture, are installed.

The fire fighting equipment is of simplified form, utilizing steam extinguishing pipe lines. An extensive system of water mains, served by high powered pumps, is also available for fighting fire.



Indicator cards for normal horsepower output

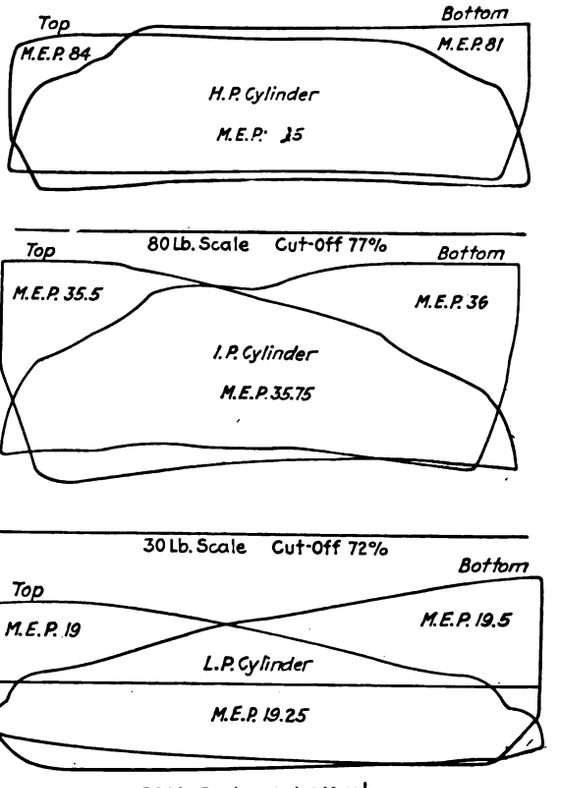
Boiler pressure, 175 pounds; H.P. receiver pressure, 162 pounds; I.P. receiver pressure, 57 pounds; L.P. receiver pressure, 15.5 pounds; vacuum, 23.25 inches; R.P.M., 90.5. Indicated horsepowers: H.P. cylinder, 648.56; I.P. cylinder, 625.2; L.P. cylinder, 894.32; total indicated horsepower, 2,168.08. Piston rod areas (diameter of rods, 5⅛ inches) have been deducted in computing horsepowers.

Results of Trial Trip

Opportunity was taken on the completion of the vessel to conduct a series of sea trials which were under the supervision of the technical staff of the shipyard and of the marine department of the Standard Oil Company of Indiana. These trials were run on April 4, the operation of the ship proving entirely satisfactory. Three days later the vessel was delivered to the owners.

Tables I and II and the typical indicator cards reproduced with this article show in detail the operation of the machinery for the trial trip. The runs marked Nos. 2, 3, 4 and 5, constituting the first portion of the trials, were made over a distance of 24.25 miles from off the Lorain light to the South East shoals. During this time the average revolutions per minute were 96.189, giving a speed of 13.22 miles per hour with a propeller slip of 15.6 percent. The remaining seven runs were made from the South East shoals to the Cleveland crib, a distance of 41.25 miles. The elapsed time for these runs was 3 hours and 5 minutes The average revolutions per minute on this series was 95.3, the speed 13.37 miles per hour and the propeller slip 13.8 percent.

During the trial the vessel was in a loaded condition, having a draft forward of 17 feet 10 inches, a draft aft of 18 feet 3 inches and a mean draft of 18 feet ½ inch. All the test runs were of one-half hour duration except the last, No. 12, which was 15 minutes in length. Weather conditions were excellent.



Indicator cards for maximum horsepower output

Boiler pressure, 175 pounds; H.P. receiver pressure, 168 pounds; I.P. receiver pressure, 65 pounds; L.P. receiver pressure, 15.5 pounds; vacuum, 24.75 inches; R.P.M., 95.5. Indicated horsepowers: H.P. cylinder, 689.79; I.P. cylinder, 858.597; L.P. cylinder, 1,211.12; total indicated horsepower, 2,759.517. Piston rod areas (diameter of rod, 5⅛ inches) have been deducted in computing horsepowers.

The results for runs No. 6 to No. 12 inclusive gave an average indicated horsepower of 2,490; main feed water to boiler, 42,538 pounds per hour, of which the main engine steam consumption amounted to 35,072 pounds per hour and the steam consumption of the auxiliaries, 7,466 pounds per hour. The evaporation for the main engine only was 14.08 pounds per indicated horsepower per hour, while for all purposes the evaporation amounted to 17.08 pounds per indicated horsepower per hour. The auxiliaries represented 17 percent of the total evaporation.

During the run the fuel oil consumption amounted to 940 gallons, which gave an average of 341.4 gallons per hour or 2,840 pounds of oil per hour. In terms of indi-

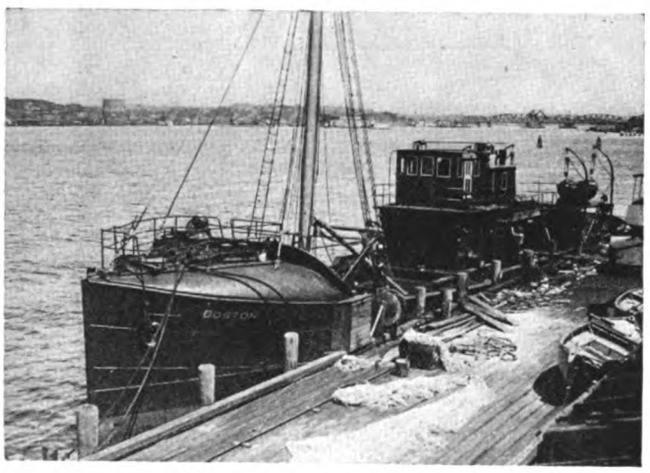
Generated on 2024-09-12 14:19 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

cated horsepower, the fuel consumption amounted to 1.14 pounds of oil per indicated horsepower per hour and in terms of evaporation, 14.9 pounds per pound of oil per hour. The boiler efficiency during the run was 80.1 percent.

Diesel Trawler Boston

AMONG the vessels that ply between the Boston fish wharves and the fishing banks off shore there is a typical example of a steam trawler that has been converted to Diesel power. The fishermen know her now as the trawler *Boston,* but they also remember her in the days when black smoke issued from her funnel as hard working firemen strove to keep steam on her that she might make the fish wharves in time to discharge her hold full of fish. Then she was known as the *Ripple.* During the world war, she saw service in the Navy under that name, but she was destined never to return to the fishing grounds again as a steam trawler.

During the summer of 1925, the vessel was purchased by the Massachusetts Trawling Company, of Boston, Mass., and was converted to Diesel power at the shipyard of the New London Ship & Engine Company, at Groton, Conn. Many radical changes were



The motor trawler Boston

made in the entire boat. The mizzenmast was removed, new deck houses were built and, by virtue of the space saving qualities of a Diesel installation, a much larger fish hold was made possible.

Propelling Machinery

The trawler *Boston* has a length overall of 121 feet 6 inches, a beam of 22 feet 3 inches and a draft of 13 feet. Her main engine is a Nelseco Diesel of the direct reversible, six-cylinder, four-cycle, mechanical injection type, commonly known as Model 6 MIR-18, which develops 345 shaft horsepower at 275 revolutions per minute. This type of engine has a fuel consumption per hour of slightly less than 20 gallons.

A 2 MI-18 Nelseco Diesel, developing 100 horsepower at 260 revolutions per minute, direct connected to an Electro Dynamic direct current generator delivering 65 kilowatts at 250 volts, furnishes the power necessary for the auxiliary machinery.

Auxiliaries

An auxiliary air compressor generator set, consisting of a 10 kilowatt 250-volt direct current Electro-Dynamic Company generator driven by a 15 horsepower Venn Severin Diesel engine, supplies the necessary current for small auxiliaries and lighting. A 5-cubic foot Nelseco type air compressor for emergency use is connected to this engine by a clutch. The main air compressor is a 10-cubic foot Norwalk machine, driven by a Morse silent chain from the forward end of the main engine. The main engine circulating water, lubricating oil and fuel oil transfer pumps are integral with the main engine, driven from one end of the cam shaft. The auxiliary circulating water pump is a Gould centrifugal, motor-driven, delivering 100 gallons at 1,740 revolutions per minute. This pump is also used as an auxiliary fire and bilge pump. The fire and bilge pump is a Gould Pyramid, delivering 28 gallons per minute, and is chain-driven from the main shaft. Gould hand pumps are used for the auxiliary pumping of lubricating and fuel oil. The maneuvering air storage bank consists of four 10-cubic foot air flasks.

The inner bottom water tanks of the trawler were tested and made oil tight and are used as the main fuel oil tanks. These have a capacity of about 10,000 gallons. A cylindrical tank of 320 gallons capacity is used as a main lubricating oil tank. Lubricating and fuel oil gravity tanks of 25 gallons capacity are installed for each engine. A switchboard located in the forward end of the engine room provides adequate control of the electric power.

Deck Machinery

The main windlass used in trawling is located on the main deck at the forward end of the house. This was converted from steam to electric power. A small electric winch furnishes the necessary power for hoisting fish from the main hold. This is located on the main deck just forward of the main mast. The heating system consists of an American Radiator Company's steam boiler, connected to radiators in all quarters. Brass radiators are installed in the pilot house.

Accommodations

The crew's quarters are located aft, between decks, and provision is made for 14 men. The engineer's quarters are in the after end of the main house. Forward of the engine room are quarters for the oilers and the cook. Just aft of the pilot house are the quarters for the captain and mate. The galley and mess room is between decks, below the windlass room. There is a lamp room on the starboard side of the main deck house which is completely sheathed with galvanized sheet iron. Provision for net stowage as well as ship's stores has been made in the rooms under the forecastle deck.

The fish hold is insulated with pressed cork over which is secured 2-inch spruce ceiling. Suitable division bulkheads, forming fish pounds, are built into the fish hold to facilitate the stowage of fish. In either side of the main hatch are six fish pens. There are four gallows frames, two located port and starboard abreast of the mast and two port and starboard near the after end of the main house. A unique arrangement of two booms on the main mast aids in the rapid unloading of fish. Electric flood lights provide ample light on deck for night work.

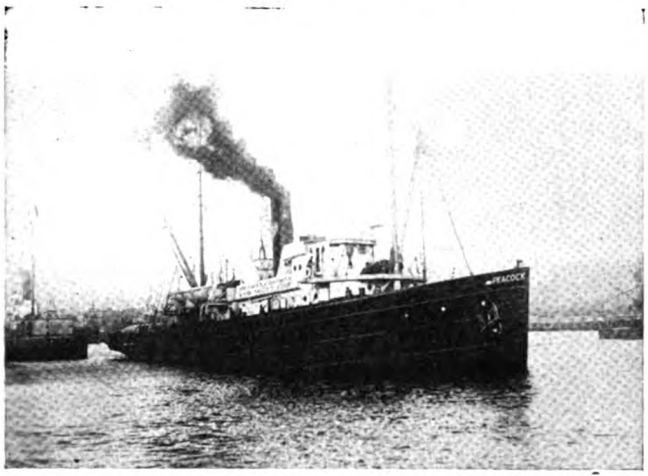
The steering gear is of the hand type, iron rods being used in the straight runs near the rail. Large hinged scuppers in the bulwarks permit any water taken on the decks to run off quickly.

On her trial run, the *Boston* made a speed of 9.56 knots with her fuel tanks full of oil. Her fuel carrying capacity permits a cruising radius of over 4,000 miles. The capacity of the fish hold is about 250,000 pounds.

Generated on 2024-09-12 14:14 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

Record Salvage Voyage on the Pacific

WHAT is said to be the longest rescue voyage in maritime history has been brought to a successful conclusion by the Merritt-Chapman & Scott salvage steamer *Peacock*, a steam vessel of the Navy mine-sweeper type, of 741 tons gross, with engines of 1,400 horsepower. This voyage, which involved a 17-day run of 4,600 nautical miles from her



Salvage steamer Peacock

San Pedro, Cal., base to Nukulailai Island in the South Seas, was undertaken to float the Isthmian Line's stranded cargo steamer *Steel Maker*, of 6,187 tons gross, which was driven onto the jagged coral rocks of Nukulailai during a sudden tropical storm on March 26, with 5,000 tons of chrome ore and other cargo.

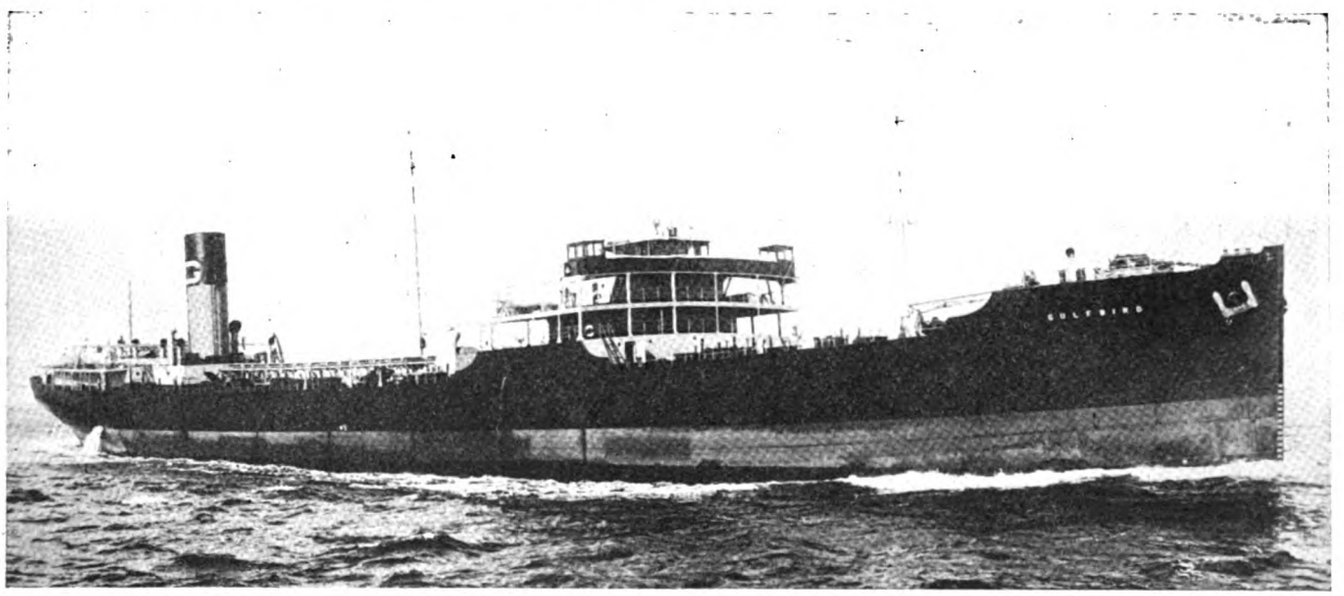
When the *Peacock* arrived at the scene, the stranded vessel, with her bottom badly damaged, was found to be lying on a coral reef in the open sea, in a location which afforded little or no protection from storms, heavy swells and strong currents. So heavy was the sea that it was impossible for the divers to apply emergency patches. Fourteen-hundred tons of cargo were jettisoned from Nos. 2 and 3 holds and five gasoline salvage pumps, capable of handling 15,000 gallons of water a minute, were set up in one of the holds and worked to capacity. Twelve days and nights of this continued effort floated the *Steel Maker* and freed her from the strand. Then, with the five pumps in continued operation the expedition on May 3 stood off for Pago Pago, Samoa, 750 miles away, the nearest safe harbor in which the divers and salvagemen could proceed with the temporary repairs. This tow was made in six days, arriving in Pago Pago on May 9. Meanwhile, the salvage crew had made temporary repairs to the hull and conditioned the *Steel Maker's* engines so that on July 10, she set out on the return voyage of 7,800 nautical miles via the Panama Canal, to dry dock in the United States. The *Steel Maker* is traveling under her own power and without convoy, the *Peacock* having returned to her home station at San Pedro.

The Gulfbird, a 15,300-Ton Doxford-Engined Tanker

By Our London Correspondent

ONE of the largest motor tankers built in England has just been completed in the *Gulfbird*, the first of three sister ships for the Gulf Refining Company. When the Furness Shipbuilding Company received this order there was a good deal of gratification in British shipbuilding circles for it represented a large expenditure at a time when British yards were not too well occupied. She is 529 feet long, overall, with a beam of 69 feet 6 inches and a molded depth of 36 feet 9 inches, a deadweight capacity of 15,300 tons being carried on a draft of about 27 feet.

The *Gulfbird* is constructed on the Isherwood bracketless system, and although most of the motor tankers of this size that have been built have been propelled by two engines, she has a single-screw installation, this being of the Doxford type which is eminently adapted for single-screw propulsion. The engine is a four-cylinder unit built by Doxfords, although Richardsons, Westgarth & Company will supply the machinery for the other two ships themselves. It has an output of



The 15,300-ton Doxford-engined tanker Gulfbird built for he Gulf Refining Company

Generated on 2024-09-12 14:15 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

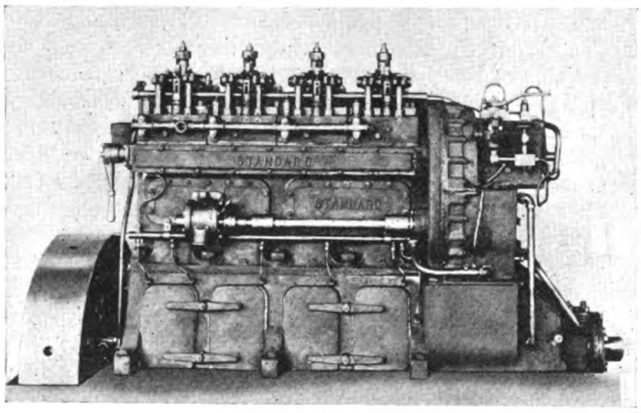
3,250 brake horsepower at 84 revolutions per minute and has four cylinders, 640 millimeters bore with a combined stroke for each cylinder of 2,480 millimeters. As is usual with this machinery, the scavenging blower is driven by the engine itself. An auxiliary generating plant is installed in the form of two M.A.N. four-stroke engines, driving dynamos of 90 kilowatts, these engines being of the airless injection design.

On trials, a speed of 11.72 knots was attained, the engine developing 3,800 brake horsepower at 89 revolutions per minute. This was in a fully laden condition.

Standard's New Small Diesel

THE Standard Motor Construction Company, Jersey City, N. J., has produced a new small Diesel for yachts, work boats and auxiliary service on board. The mere mention of a new model by the famous builders of the hundreds of ML and submarine chaser engines of war days is bound to create more than ordinary interest.

Deliveries of several of the new A. E. type Diesels have been made, the first six going to the Standard Oil Company of New York for auxiliary service in their tankers. Not only are these new 4-cylinder, 4-cycle, 6-inch by 8-inch engines ideal for driving electric generators and pumps, but they provide safe, economical power for driving work boats and yachts.



The new small Standard Diesel engine

Rated at 60 but Have Developed 75 Horsepower

These engines, rated 60 horsepower at 600 revolutions per minute, have developed 75 horsepower in several cases and operate on a consumption of 0.55 pound per brake horsepower per hour. They are claimed to be the smallest engines operating on 24-degree Beamé fuel oil; they do not require gas oil or furnace oil, but, being of the 4-cycle type, will operate without carbon and with a clear exhaust when burning this heavier oil. The manufacturers claim that perfect vaporizing of the oil in their fuel injection nozzle is greatly responsible for this clear exhaust.

The fuel is handled by three pumps, operating in parallel, on the after end of the engine over the gear housing. Any one them is capable of supplying fuel oil to the fuel injection nozzles located in the center of each cylinder head and any excess fuel over that required at the valve drains back into the system. Fuel oil reaches the orifices of the fuel injection nozzle under sufficient pressure to vaporize it thoroughly and it is strained before entering the minute orifices of the nozzle to prevent clogging and carbonizing. The fuel is strained and broken up into a fine spray, then injected directly into the combustion space of the cylinder on the airless injection tuil Diesel principle.

Starting is by low-pressure compressed air stored in a tank by a compressor on the engine, which starts cold by a slight turn of the air control lever on the forward end of the engine at the level of the single cover over the cam shaft on the intake side. This cam shaft is driven by Link-Belt chain, which also drives the pumps. This chain is housed in the upper casing immediately aft of No. 4 cylinder.

Valves

There are two inlet and two exhaust valves for each cylinder, all poppet valves, each pair being actuated by rocker arms and rods from the cam shaft. These valves are grouped near the center of the removable head of each cylinder. The cylinder heads are of such shape that the pattern and casting are simple, making a core easily removable and a casting free from imperfections.

Lubrication is by double pumps, with dry sump, providing force feed to all parts needing lubrication. There are long bronze-backed, centrifugally-poured babbitt bearings between each crank throw, supported in cross webs in the base. At these points between cylinders there are large-diameter bolts holding down the 4-cylinder *en bloc* cylinder casting. On the sides of each pair of cylinders are removable plates and opposite each crank shaft throw is an access plate, each pair of plates being held by a pair of fingers.

Crank Shaft is of Chrome Vanadium Steel

The crank shaft is of chrome vanadium steel of excess strength and diameter. On the forward end is bolted the flywheel, with governor, and on the aft end, housed in the base, is a double-clutch reverse gear. The thrust is a Timken roller thrust. The pistons have three rings near the top and one near the lower end. The pin is extra large. The connecting rods are very large I-section. Water cooling is by means of a rotary pump driven off the crank shaft by silent chain.

New Form of Asphalt Paint Developed

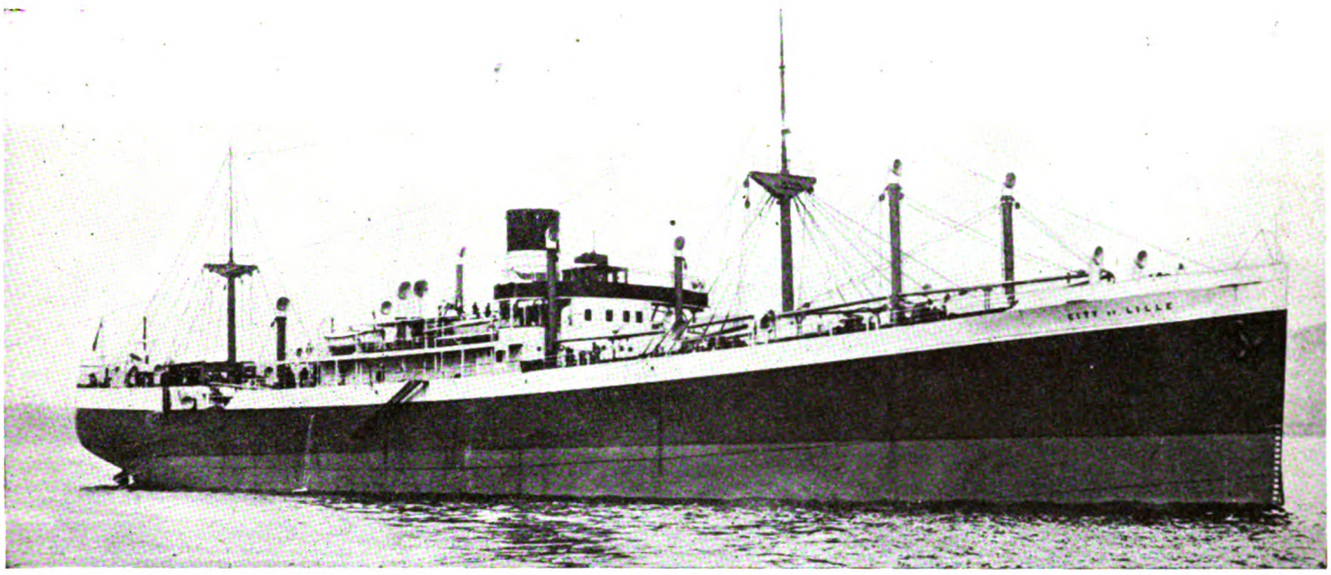
TO provide for wider and more convenient uses of asphalt paint for marine purposes and in marine construction work, an entirely new form of asphalt coating has been developed by research chemists and engineers, of E. I. duPont de Nemours & Company, Wilmington, Del.

Unlike all former methods of manufacturing asphalt paint, in which solvents and cut-back ingredients were used, the new process consists of emulsifying asphalt with water and adding chromium salts. The purpose of the salts is to render ferrous metal "passive" to corrosion while the water content of the asphalt chromate emulsion dries out, leaving a highly protective coating of asphalt.

Coats of the emulsion are applied cold, and either a brush or a spray gun may be used. A further advantage claimed is that, owing to the absence of any toxic fumes or explosive vapors, the emulsion may safely be applied in confined spaces.

Uses for which this paint are recommended include the painting of decks, pumps, tanks, chain lockers, boilers, coal bunkers, brine coils and rudders. In the marine construction field asphalt chromate emulsion will be used for coating cofferdams, pier planking and other purposes to prevent dry rot and to retard decay caused by contact with fresh or salt water.

Generated on 2024-09-12 14:54 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN



The Ellerman-Hall cargo liner City of Lille

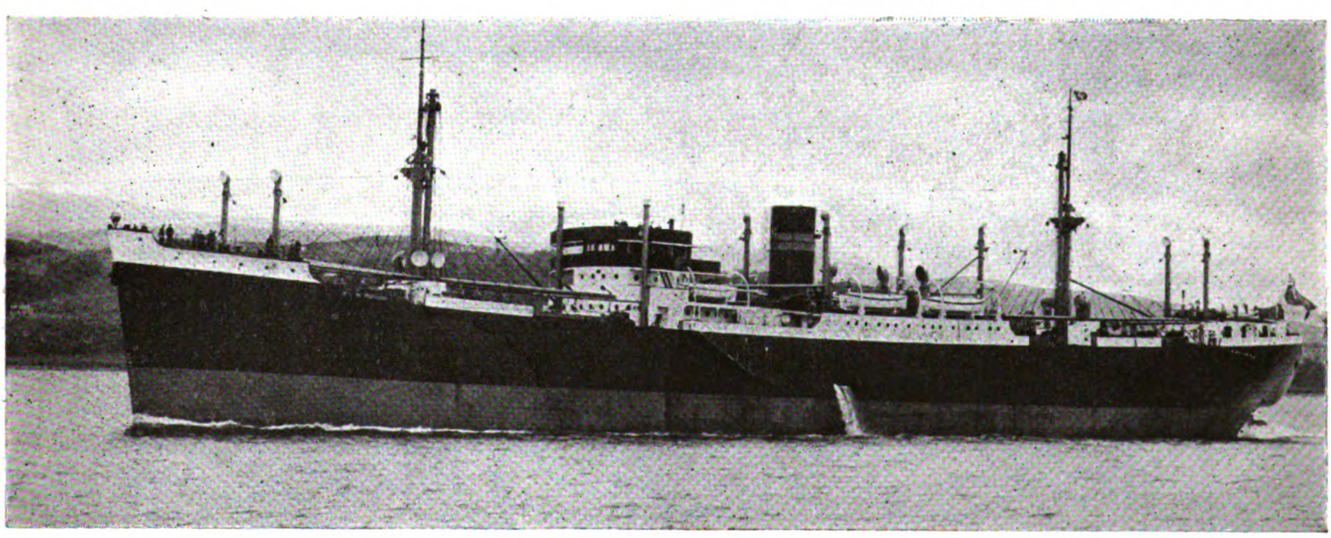
British Building Fast Cargo Liners

Development of 14- to 15-knot freighters for service between New York and the Far East and Europe

By Our London Correspondent

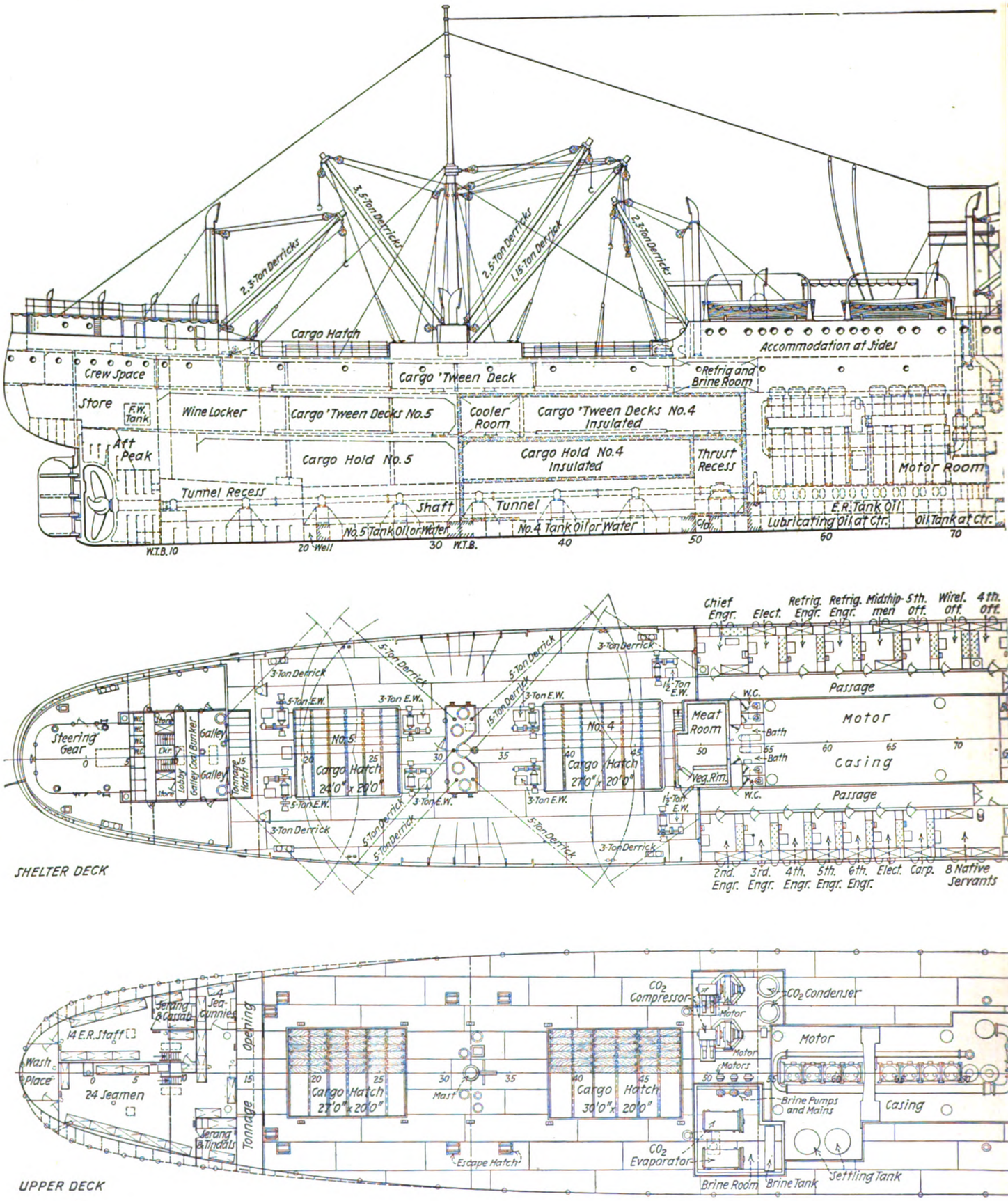
ONE of the most notable developments in European shipbuilding, and a development that will not have passed unnoticed by shipping men in America, is the increasing construction of cargo liners destined to maintain a speed at sea, when fully laden, of between 14 and 15 knots. The number of ships of this class, for the most part fitted with internal-combustion machinery, many of which have been built mainly with the idea of using them between New York and the Far East or Australia, is surprisingly large, and, naturally, when one shipowner decides to construct such high-speed craft for this service, his competitors must inevitably follow suit.

Among the firms which are building or have recently constructed ships for this purpose are the Blue Funnel Line, the Lancashire Shipping Company and the Hall Line. An exception is to be found to the employment of Diesel motors for these craft in two ships built for the Hall Line, which is, of course, owned by the Ellerman Line. Sir John Ellerman decided that in order to determine for himself whether the Diesel ship is superior to the best type of steamer, he would build three similar craft, one with quadruple-expansion reciprocating steam engines, a second with geared turbines and a third with a Diesel motor. These are all now commissioned, the last being the *City of Lille*, which is the



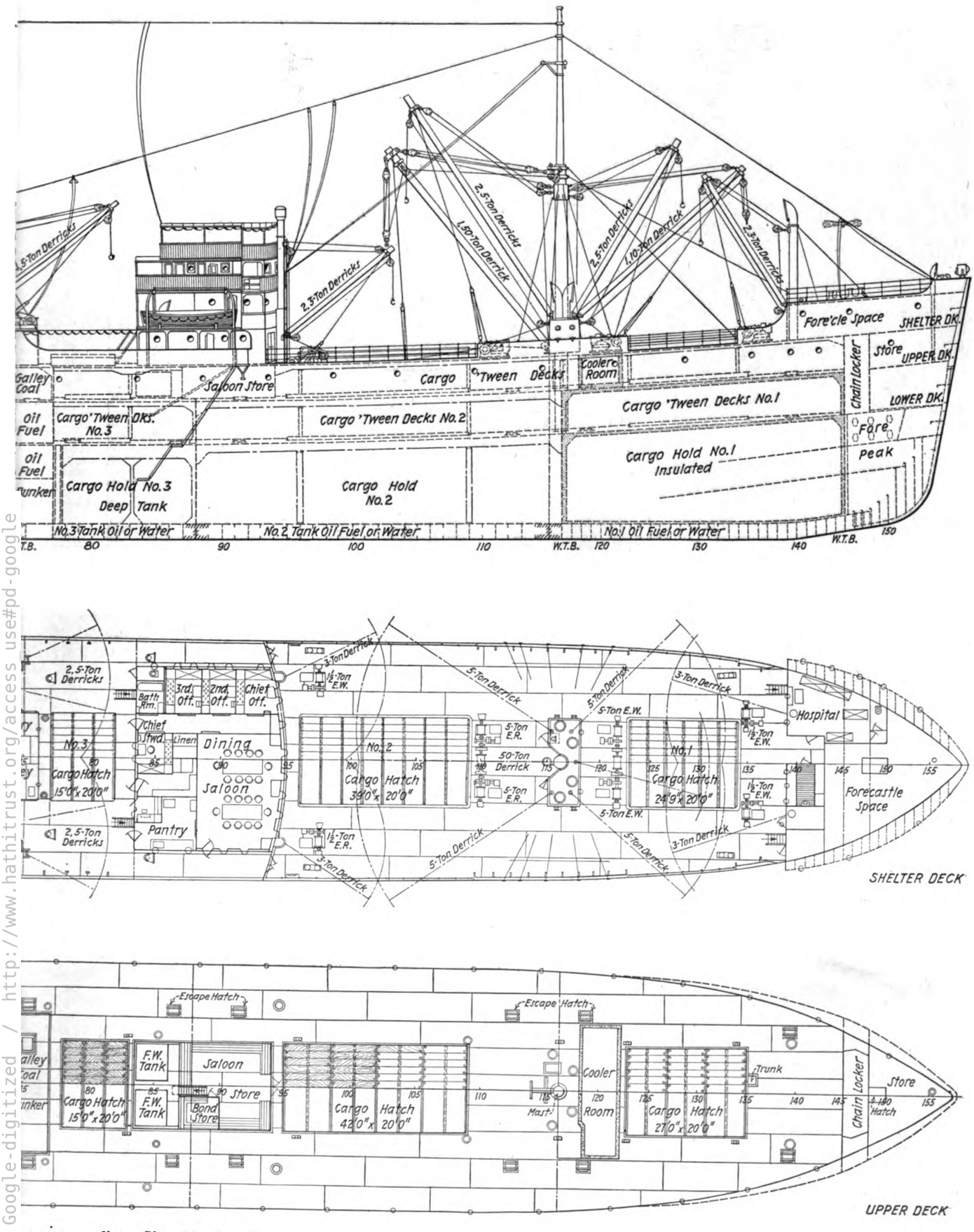
Motorship Clan Macdonald

Generated on 2024-09-12 14:14 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN



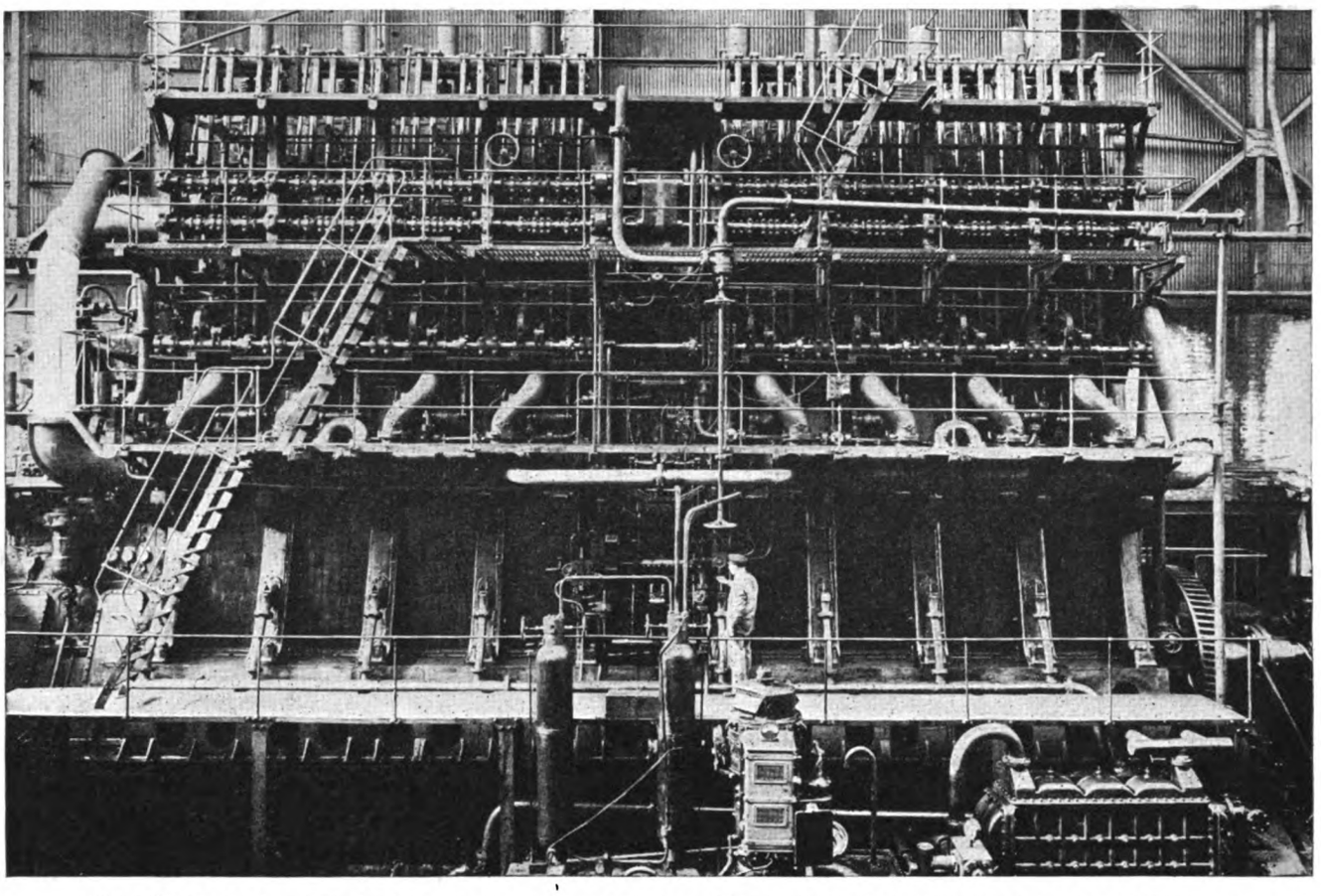
Profile and deck plans of th

Generated on 2024-09-12 14:14 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN



otor cargo liner Clan Macdonald

Generated on 2024-09-12 14:15 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN



Kincaid—B. & W., 4,500-brake-horsepower, double-acting D iesel engine installed on M. S. Clan Macdonald

motorship, and which sailed recently from the Clyde to New York for her maiden voyage to the Far East.

Another fast cargo liner which has just been completed on the Clyde is the first motorship for the Clan Line the *Clan Macdonald*. It is of interest to compare these two vessels, showing as they do such marked similarities, indicating the type of vessel which cargo liner owners are now adopting for long distance routes. The following comparison of details of the two vessels is instructive:

	Clan Liner *Clan Macdonald*	Ellerman Liner *City of Lille*
Length overall	450 feet	463 feet
Length between perpendiculars	430 feet	445 feet
Beam molded	57 feet 6 inches	57 feet 9 inches
Draft	27 feet	28 feet 1¾ inches
Deadweight capacity	9,500 tons	10,000 tons
Speed loaded	13½-14 knots	14 knots
Brake horsepower	4,500	4,500

The Clan Macdonald

The *Clan Macdonald* is the first motorship to be built for the Clan Line, but, before she was completed, the owners ordered a similar though somewhat larger vessel. They are, however, by no means wedded to motorships for, in the meantime, they have also contracted for a vessel of about the size and speed of the *Clan Macdonald* and in which propelling machinery operating on the Bauer-Wach system is to be utilised. Thus, they, like the Ellerman Line, will be able to make their own comparison between steam and motorships, but it is an indication of the number and type of propelling machinery available that in their steamer they are utilising an entirely different arrangement from that adopted in the two steamers of the Ellerman Line.

The arrangement of the hull of the *Clan Macdonald* typifies the modern fast cargo liner, especially as adapted for motor propulsion. There are two holds forward and two aft of the engine room, with a cargo hold between the engine room and No. 2 hold for carrying cargo oil. A certain amount of refrigerated space is available and it need hardly be added that the cargo is handled wholly by electric winches, of which no fewer than 18 are provided. Curiously enough, this is the exact number fitted on the *City of Lille*, of which details will be given later, also on the new 14½ to 15-knot Holt Line motorships which have recently been ordered. Practically all the other auxiliary plant on the ship is electrically-driven, although the galley is coal-fired.

A Double-Acting Engine

The *Clan Macdonald* is, in one respect, a pioneer ship, for she is the first cargo vessel to be propelled by a double-acting, four-stroke engine of the Burmeister & Wain type. She is the first single-screw ship to have this class of machinery and the engine is the first built under license by the well-known Clyde engine manufacturers, J. G. Kincaid & Company.

It is an eight-cylinder model, but the design is precisely the same as that in the R.M.S.P. liner *Asturias* and in the *Gripsholm*. The cylinders have a diameter of 680 millimeters and a piston stroke of 1,400 millimeters. An output of 4,500 brake horsepower is developed at 110 revolutions per minute. This is equivalent to 5,900 indicated horsepower. A feature which is not employed on the passenger liner engines is the fuel valve lift control which affects the lift of the fuel valves of the top and bottom cylinders so as to allow sufficient flexibility of speed for a single-screw cargo ship. Another interesting detail worthy of notice is the adopton of ball bearings for the push rod rollers.

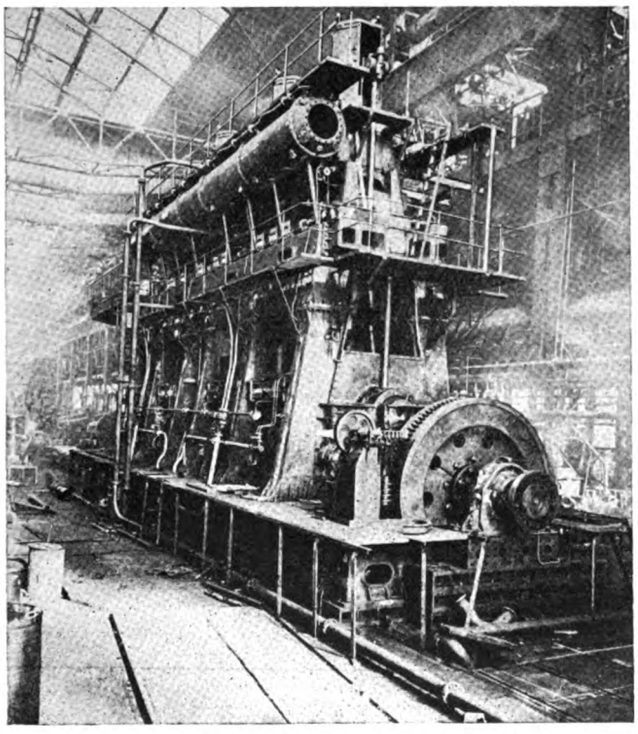
Generated on 2024-09-12 14:34 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

The auxiliary generating machinery calls for no special comment. There are three dynamos of 125 kilowatts each driven by a 180-brake-horsepower Burmeister & Wain type Diesel motor and a fourth of 100 kilowatts. There is, however, one point of particular interest in the auxiliary arrangement. Bearing in mind the amount of heat that is carried away with the exhaust in a four-cycle engine of this output it was decided to install an exhaust heat boiler of the new Clarkson type which has been developed specially for Diesel engines. As a result, all the steam is raised that is necessary at sea for certain auxiliary purposes, such as heating the accommodation, fuel and lubricating oil and supplying the galley and the cabins. It is estimated that, in this way, an economy equivalent to 1 ton of fuel daily can be effected, and as the total daily consumption for all purposes of the vessel when proceeding at 13½ knots will probably be about 20 tons, it will be seen that the efficiency is raised to the extent of about 5 percent.

Fuel oil can be carried in all the double bottom tanks, in addition to which a deep tank is arranged forward of the engine room, so that the total capacity is about 1,700 tons. The total radius of action is thus somewhere between 25,000 and 30,000 sea miles.

The City of Lille

The *City of Lille* has but three cargo holds, which are larger than those in the *Clan Macdonald.* She will be engaged regularly on the trade between New York and the Far East, and probably to Australia. She also is a single-screw ship, but as she is equipped with a Doxford engine of the opposed piston design, it is of interest to compare the machinery with that of the *Clan Macdonald.* The Doxford engine has only four cylinders, of 680 millimeters bore and with a combined stroke of the two pistons in each cylinder of 2,720 millimeters. So far as space is concerned, it appears that there is very little difference between that required for the two-stroke, single-acting Doxford engine and the Burmeister & Wain double-acting, four-stroke design. The length of the engine room including the thrust recess, in each ship, is somewhere in the neighborhood of 60 feet, and it is likely that the difference in weight between the two designs is almost negligible.



Doxford type 4,500-brake-horsepower Diesel engine installed in the M. S. City of Lille

The motor installed in the *City of Lille* was built under license by Barclay, Curle & Company, associated with Swan, Hunter & Wigham Richardson, which is now, with Harland & Wolff, the biggest shipbuilding concern in Britain. This is an indication of the increasing popularity of the Doxford type of motor, which is considered by many shipbuilders and shipowners to represent a thoroughly good sea-going class of oil-engine. The output of 4,500 to 5,000 brake horsepower in four cylinders is noteworthy, representing a maximum cylinder output of 1,250 brake horsepower, a figure not exceeded by any double-acting engines in service. Hence the claim that it is not essential even now to proceed to double-acting motors in order to obtain the highest power that may be needed.

One of the differences between the Burmeister & Wain double-acting design in the *Clan Macdonald* and the Doxford engine in the *City of Lille,* that will be of interest to engineers, is that in the former lubricating oil is used for cooling the pistons, but Doxfords invariably adhere to distilled water for both pistons and cylinders. There is a difference in pressure, however, as the piston cooling requires water at 45 pounds per square inch and the cylinders at 25 pounds per square inch. This is supplied from one electrically-driven pump with two stages, the low-pressure stage for the cylinders and the high-pressure stage for the pistons.

As is the case with the previously described vessel, an exhaust heat boiler is fitted in the *City of Lille* but, on account of the lower temperature of the gases from a two-cycle engine, less steam is generated. Actually, it is raised at a pressure of only about 10 or 15 pounds per square inch, and its purpose is to heat a certain amount of the accommodation—not all—also the fuel and lubricating oil before it is supplied to the centrifugal separators for purification.

Large bunker capacity is one of the distinctive features of the *City of Lille,* for she has two deep tanks arranged at the forward end of the engine room, in addition to which, fuel or water ballast can be carried in all the double bottom tanks except one under the engine room which is utilised as a drain tank for lubricating oil. As a result, the fuel oil capacity is over 1,700 tons, so that the ship could proceed at full speed at sea for a period of nearly three months without requiring any more oil after filling up the tanks. She has three 110-kilowatt generating sets for the supply of electric power and there are 18 electric winches on deck.

Six Motor Cargo Liners

In the past two months, six motor cargo liners have been ordered by three different British firms, all for trade between New York and the Far East. In order to show the approach toward standardisation in type, the following particulars of the three pairs of vessels are not without interest. These are for the Blue Funnel Line, two for the Prince Line (Furness, Withy & Company) and two for the Lancashire Shipping Company (the Castle Line).

Blue Funnel Cargo Liners

Length between perpendiculars	452 feet
Molded beam	59 feet
Draft	28 feet
Shaft horsepower	6,000
Sea speed	14½ knots

Generated on 2024-09-12 14:14 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

Prince Line Cargo Liners

Length between perpendiculars	442 feet
Beam	60 feet
Draft	27 feet 7 inches
Shaft horsepower	6,000
Speed	14½ knots

Lancashire Shipping Company's Cargo Liners

Length between perpendiculars	450 feet
Molded beam	60 feet
Draft	27 feet
Brake horsepower	4,500
Loaded speed	13½ knots

The Blue Funnel ships are, perhaps, the most interesting, for although the machinery is of a standard twin-screw Burmeister & Wain single-acting design, the owners, after experience in two previous vessels, have taken advantage of the possibilities of supercharging, and will install electrically-driven blowers which, by supplying air to the cylinders under pressure, will enable the output to be increased, if necessary, by about 10 percent. In this way, it is possible to raise the speed of the ship nearly half a knot for prolonged periods, so that although they will usually be considered as 14½-knot vessels, it is believed that they will maintain 15 knots at sea when fully laden when the necessity arises.

A somewhat similar policy, however, is likely to be adopted with the Castle Line vessels. Although it is apparently not the intention to fit superchargers in the first instance, the shafting is all designed so that, if necessary, an additional power of 50 percent can be transmitted. This will be done by adding superchargers on the Büchi system. The exhaust gases from the propelling engines will be delivered to the turbine driving the blower, supplying air under considerable pressure to the working cylinders. The Büchi system has been tried out and found highly satisfactory, permitting an engine to develop up to 50 percent more than its normal output without increasing maximum temperatures or pressures to any extent. The system is to be used on 13 Italian motorships now under construction, and it is also being fitted to a large British vessel so that practical results of its performance at sea will be available.

S. S. Mercer Completes Fourth Successful Voyage

THE premier pulverized fuel ship, the S. S. *Mercer*, has completed her fourth transatlantic voyage and now has a record of over 30,000 miles to her credit.

This vessel, in which the pulverized fuel installation was an extension of the experimental development work carried on by the U. S. Navy and the U. S. Shipping Board at the Philadelphia Navy Yard test plant, has been in continuous active service since November 16, 1927, without any interference or delay whatsoever in her operating schedule, having maintained her sailing position at all times in the regular advertised schedule of the American Diamond Lines.

A review of her activities for the four voyages shows her to have spent approximately 35 percent of her time in port and 65 percent on the high seas. This ratio of port to sea time gives a somewhat greater portion to deep sea sailing than that of the average cargo vessel engaged in this particular trade, which has four port calls for loading and discharging cargo in the United States.

A synopsis of her activities as indicated by the following schedule shows how little time has been available to make the desired changes in the equipment to carry out the experimental development work.

Voyage One

Arrived		Leave
	New York	11-16-27
11-17-27	Philadelphia	11-19-27
11-20-27	New York	11-23-27
12- 8-27	Rotterdam	12-17-27
1- 2-28	New York	

Average observed speed 9.33 knots

Voyage Two

Arrived		Leave
1- 2-28	New York	1- 7-28
1- 9-28	Baltimore	1-14-28
1-15-28	Norfolk	1-17-28
1-19-28	New York	1-27-28
2-12-28	Rotterdam	2-18-28
3- 9-28	New York	

Average observed speed 8.39* knots

Voyage Three

3- 9-28	New York	3-10-28
3-11-28	Philadelphia	3-17-28
3-19-28	Boston	3-21-28
3-23-28	New York	3-30-28
4-14-28	Rotterdam	4-20-28
5- 4-28	New York	

Average observed speed 10.15 knots

Voyage Four

5- 4-28	New York	5- 5-28
5- 6-28	Philadelphia	5-12-28
5-14-28	Boston	5-16-28
5-18-28	New York	5-24-28
6- 7-28	Rotterdam	6-15-28
6-28-28	New York	

Average observed speed 10.73 knots

* No distributors working and heavy weather on this voyage.

It is to be noted that her best speed, when operated as an oil-burner was 10 knots.

Voyages 1, 2 and 3 were made with the vessel steaming on two boilers only.

Voyage 4, east bound, was also made with two boilers, but the west bound passage, which was made in 12 days, 18 hours and 41 minutes at an average speed of 10.94 knots, was made with all three boilers fired with pulverized coal. The distributing piping had been modified by the crew while in Rotterdam so that the port and center boilers were supplied from one mill, while the starboard boiler was supplied by the other mill.

While the vessel has been at sea, development work has been continued at the Philadelphia Navy Yard test plant and the result of this development work has been applied to the S. S. *Mercer* during the period when she was loading and discharging cargo in the United States.

At the termination of voyage 1, modifications were made to the feeders and the primary air fans and the original distributors which had given considerable trouble on the first voyage were removed, so that voyage 2 was made without any distributors, which fact interfered greatly with satisfactory operation.

At the termination of voyage 2 modified mechanical distributors and new primary air fan turbines were installed and the piping was rearranged on the starboard boiler. The modified distributors gave better service than the original but were not entirely satisfactory.

Therefore at the termination of voyage 3 pneumatic distributors, which had been developed at the test plant, were substituted for the mechanical distributors. These new distributors on voyage 4 gave very good results and permitted modifications of piping so as to enable all three boilers to be fired with pulverized coal.

The S. S. *Mercer* has, during these four voyages, fully demonstrated the safety and reliability of pulverized fuel for use on shipboard.

The ultimate economy of this type of fuel cannot, of course, be expected on the S. S. *Mercer* as the driving units for the various parts of the equipment were selected from an experimental view point. They were chosen so as to have a wide flexibility of speed and power with no possible likelihood of breakdown rather than from the view point of economy. This was necessary in order to determine just what speeds and power would be needed on a sea-going installation. The *Mercer* has, however, in spite of this handicap shown a 10 percent improvement over hand firing which has increased on each passage since the second voyage.

No changes were made in her equipment at the termination of her fourth voyage but further changes are contemplated on later voyages, depending upon the results of experiments now being conducted at the test plant.

Generated on 2024-09-12 14:19 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

Brown Boveri Combined Reciprocating Engine and Turbine Drive

Arrangement developed abroad by Brown-Boveri & Company adopted by American Brown Boveri Electric Corporation

OWING to the limited volume of its low-pressure cylinder, a reciprocating engine is unable to utilize a high vacuum, whereas a steam turbine can employ one to the fullest advantage. It was due to this fact that Parsons proposed, in 1894 (i. e., very soon after the introduction of the first steam turbine), to combine a reciprocating engine and turbine, the turbine to use the exhaust steam from the engine in order that the maximum possible heat drop could be made available. In the British patent No. 13019, which he took out in 1906, Parsons extended his idea to a marine plant intended principally for low-powered cargo vessels. Both machines delivered their power to a common propeller shaft, the high-speed exhaust-steam turbine driving on to the slow-running shaft through reduction gearing.

In the following years this combined drive did not receive so much attention due to several circumstances, the principal one being the introduction of the direct turbine drive and, later on, the advent of the turbine drive through reduction gearing. In the few plants which were built, the exhaust-steam turbine always drove a separate shaft, either directly or through reduction gearing, as, for example, the power plant of the liner *Reliance* of the Hamburg-American Line for which Brown Boveri & Company supplied the exhaust-steam turbine in 1912-13. This type of propulsion with several propeller shafts is, however, satisfactory only when used for large powers. The previously mentioned idea of Parsons for ordinary cargo vessels with engines of low power was therefore taken up by Brown Boveri & Company in 1919, and, in cooperation with the Howaldtswerke in Kiel, various projects for such plants were laid down. Some of these were for ships already in service and others were for new vessels. Due to the difficult economic conditions prevailing immediately after the war, no orders were received for such plants, although the great advantages which they possessed as

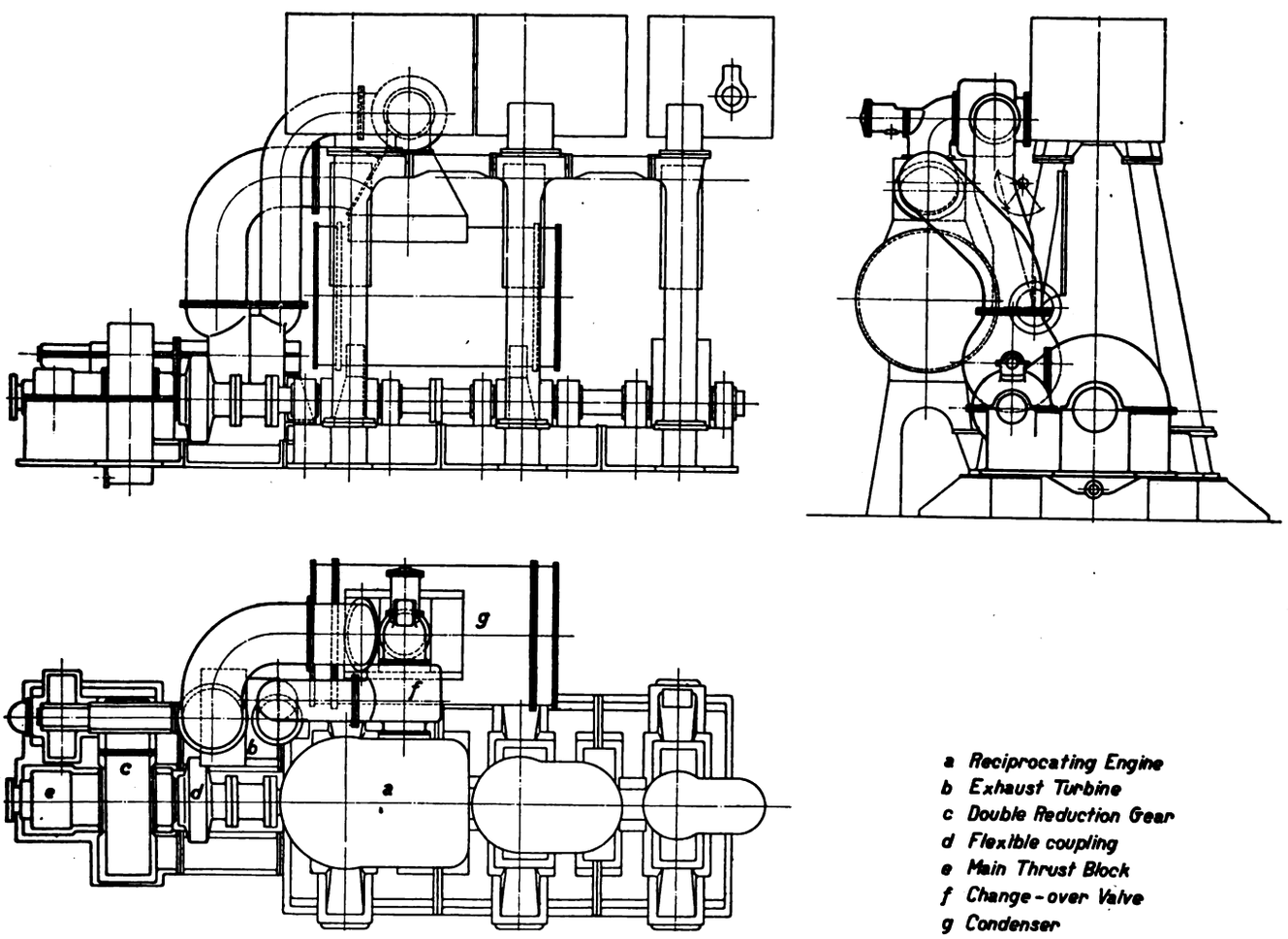


Fig. 1.—General arrangement of reciprocating engine and exhaust turbine (Brown Boveri system). Total indicated horsepower, at 76 propeller revolutions per minute, 4,250

Generated on 2024-09-12 14:16 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

regards to the steam consumption were well known.

As previously mentioned, by connecting an exhaust-steam turbine to the low-pressure end of the reciprocating engine an appreciably higher vacuum can be used; a larger heat drop is therefore immediately available. For instance, the heat given up by steam in expanding adiabatically from 200 pounds gage and 200 degrees F. superheat down to a vacuum of 25 inches (referred to a 30-inch barometer) is about 340 British thermal units, whereas if the adiabatic expansion were continued down to a vacuum of 28½ inches (95 percent vacuum) as is usual in turbine practice, the heat given up is 400 British thermal units. In addition to this direct saving by increasing the heat drop, the efficiency of the low-pressure cylinder of the reciprocating engine rises appreciably when working in combination with an exhaust-steam turbine. This follows from the fact that the losses in the low-pressure cylinder of the reciprocating engine through the reduced exhaust port openings on account of the smaller volume, and also the condensing losses, are very much smaller.

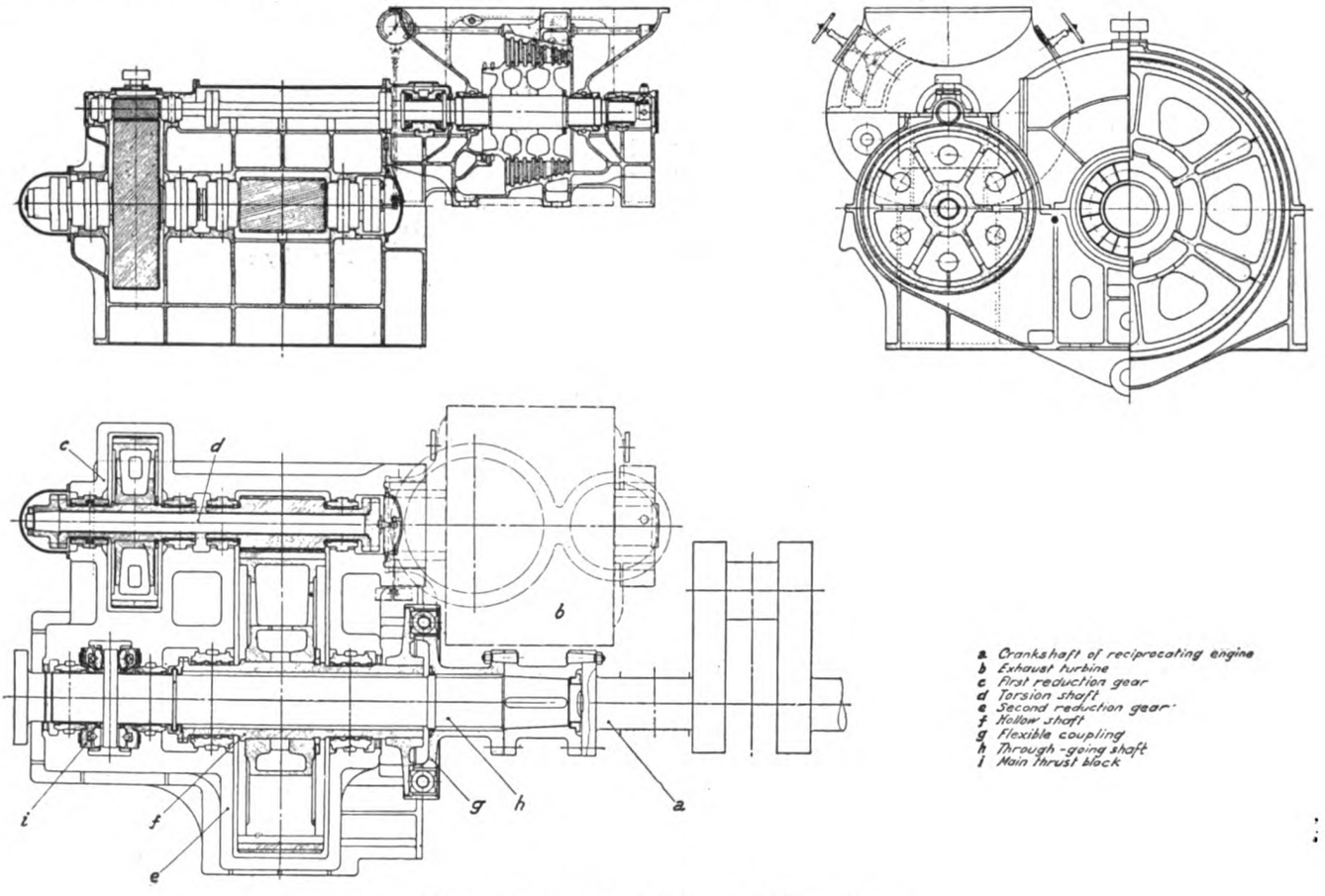


Fig. 2.—Brown Boveri exhaust turbine plant

Efficiency Increased 18 to 35 Percent

The increase in the efficiency, referred to the total output, obtained by combining an exhaust-steam turbine is from 18 to 35 percent according to the working conditions. The lower values would be obtained with an efficient engine using a poor vacuum and the higher values with an efficient engine and a good vacuum. The condition of the steam also comes into effect here. For a standard plant an improvement in the steam consumption of 25 to 30 percent can be expected, or, for the same steam consumption, a corresponding increase in output. For a triple-expansion engine working on superheated steam at a boiler pressure of about 200 pounds per square inch gage and at 200 to 300 degrees F. superheat the steam consumption per indicated horsepower drops to about 10.3 to 7.7 pounds when an exhaust-steam turbine is working in series with the engine. The output of the reciprocating machine, however, drops by about 10 percent as a result of the reduced heat drop (higher back pressure of the reciprocating engine), this loss not being completely counterbalanced by the better efficiency of the low-pressure cylinder.

The improvement in the steam consumption can be turned to account in one of two ways: Either the quantity of coal burned can be reduced and the speed of the engine, and therefore of the ship, kept constant, or the speed of both engine and ship can be increased and the coal consumption kept the same. It is generally preferred to adopt the latter solution for existing vessels into which an exhaust-steam turbine has been built at a later date, as the boilers have already the necessary capacity and, moreover, during recent years the tendency has been to increase the speed of cargo ships, which is immediately rendered possible by installing an exhaust-steam turbine. When building new ships, the reciprocating engine and the boilers can be designed to suit the new conditions.

To obtain the increased vacuum required by the exhaust-steam turbine, the condenser plant must be made correspondingly larger than that for a reciprocating steam engine. In existing ships the cooling surface of the condenser is usually sufficient for the higher vacuum,

Generated on 2024-09-12 14:19 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

but the specific load should nevertheless not exceed 8 pounds of steam per square foot of cooling surface. The cooling-water pump must, however, be enlarged to cope with the increased quantity of circulating water which should not be less than 70 to 80 times the amount of steam to be condensed. An air ejector, similar to the Parsons vacuum augmenter, is also added to the existing air pump.

About two years ago this old proposal of Parsons of combining a reciprocating engine and an exhaust-steam turbine and driving on to a common propeller shaft was revived. In the arrangement developed by Brown Boveri & Company the exhaust-steam turbine is coupled direct to the propeller shaft driven by the reciprocating engine by means of mechanical reduction gearing. With this arrangement the turbine has always to follow the alterations in the direction of rotation of the reciprocating engine when maneuvering. Due to the high speed of rotation the turbine rotor has a comparatively large kinetic energy which has to be destroyed when reversing. In the Brown Boveri plants of this kind, therefore, special reverse blading (see Fig. 2) is provided at the exhaust end of the turbine to which live steam is admitted direct when reversing the engines; the reciprocating engine is thus aided when being reversed. The admission of the live steam when reversing the reciprocating engine is effected compulsorily as will be seen from the arrangement of the reversing gear shown in Fig 3, described later.

Machinery for North German Lloyd Ships

Figs. 1 and 2 illustrate a Brown Boveri exhaust-steam turbine plant, as at present under construction for two cargo vessels for the North German Lloyd Line at the shipyard of the Bremer Vulkan. Fig. 1 shows the whole machine plant; the relative sizes of the exhaust-steam turbine and the reciprocating steam engine can readily be seen. The floor area taken up by the turbine and reduction gear is comparatively small, especially when taking into account that the propeller thrust block is incorporated in the casing of the reduction gear. Thus the space available for building an exhaust-steam turbine into a ship already equipped with reciprocating engines with the old type of thrust bearing having a large number of horseshoe shaped thrust rings is generally sufficient as far as the length is concerned. The design of the exhaust-steam turbine and of the double-reduction gear, and also their arrangement with respect to the reciprocating engine and the propeller shaft, can be seen from Fig. 2. In these ships the engines develop an output of 3,300 indicated horsepower when using steam at 215 pounds per square inch gage and 575 to 600 degrees F. total temperature at the engine. The combined output of reciprocating engine and exhaust-steam turbine, when consuming the same weight of steam under similar conditions and working with a vacuum of about 95 percent, is approximately 4,250 indicated horsepower, which represents an increase in output of about 30 percent.

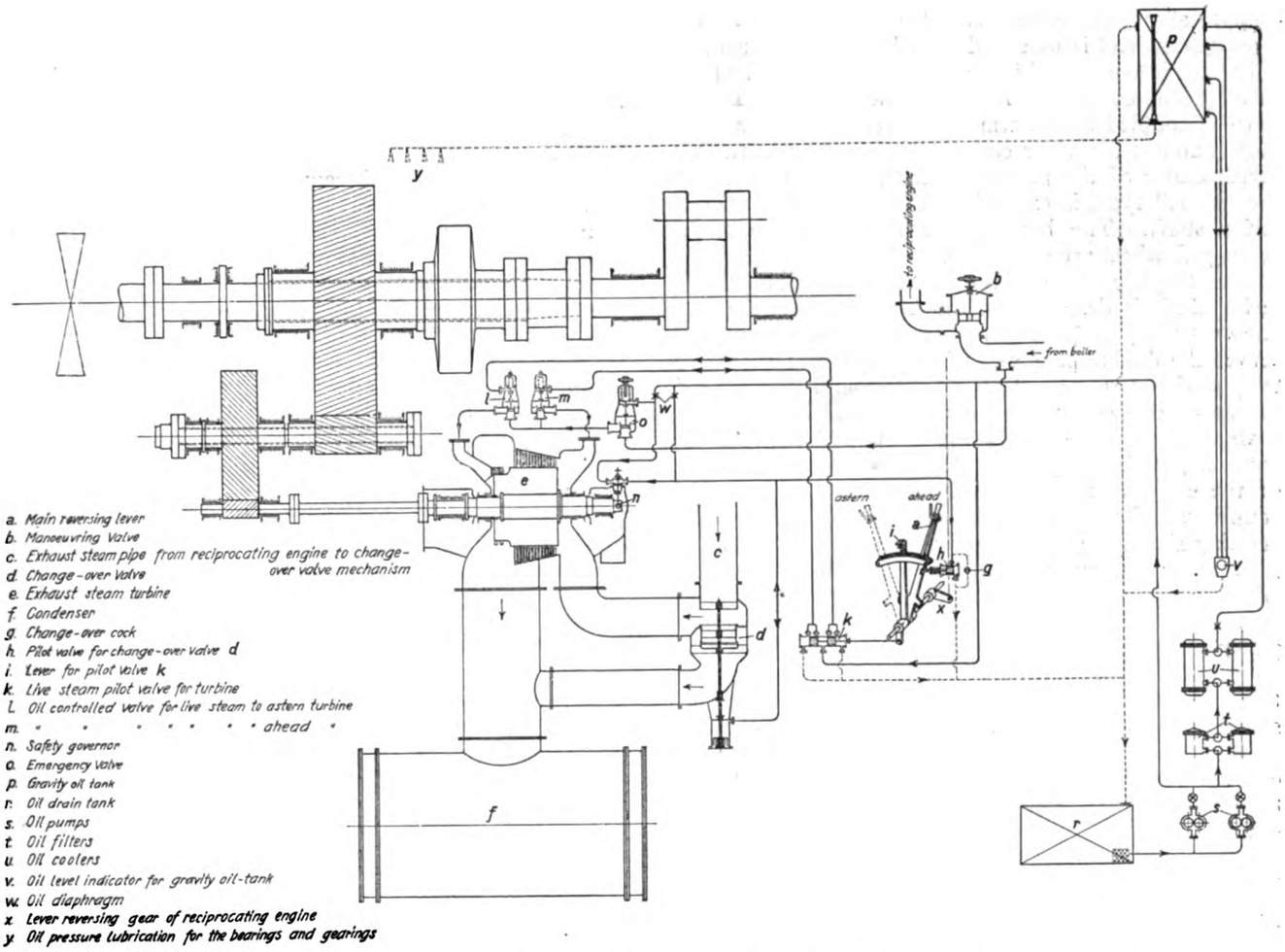

a. Main reversing lever
b. Manoeuvring Valve
c. Exhaust steam pipe from reciprocating engine to change-over valve mechanism
d. Change-over valve
e. Exhaust steam turbine
f. Condenser
g. Change-over cock
h. Pilot valve for change-over valve d
i. Lever for pilot valve k
k. Live steam pilot valve for turbine
l. Oil controlled valve for live steam to astern turbine
m. " " " " " " ahead "
n. Safety governor
o. Emergency Valve
p. Gravity oil tank
r. Oil drain tank
s. Oil pumps
t. Oil filters
u. Oil coolers
v. Oil level indicator for gravity oil-tank
w. Oil diaphragm
x. Lever reversing gear of reciprocating engine
y. Oil pressure lubrication for the bearings and gearings
astern
ahead
from boiler

Fig. 3.—Diagrammatic arrangement of Brown Boveri exhaust turbine, showing method of control

Generated on 2024-09-12 14:20 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

Following standard Brown Boveri practice the turbine is built as a reaction turbine; it has eight rows of blading. When running at full load the steam enters the turbine at a pressure of 6 to 7 pounds per square inch gage. To enable, at partial loads, a suitable repartition of the output between the engine and turbine, a by-pass valve is provided at the admission end of the turbine. The turbine runs at about 3,400 revolutions per minute, and this speed is reduced to that of the propeller, viz., 76 revolutions per minute, in a double-reduction gear. The wheel of the first gear and the pinion of the second, which are mounted on the intermediate shaft, are connected by a torsion shaft. The large gear wheel is mounted on a hollow shaft running in its own bearings and is connected to the interior shaft by a flexible coupling. At its forward end the interior shaft is coupled to the crank shaft of the reciprocating engine and at the other end to the propeller shaft. The thrust collar of the propeller thrust block, which is of the Michell type, is carried on the rear end of this interior shaft. The housing for the thrust block and large gear wheel are built in one.

The coupling between the reduction gear and the interior shaft is designed on the same lines as the well-known spring coupling for electric locomotives. It serves the double purpose of equalizing the uneven torque of the reciprocating machine and the steady torque of the exhaust-steam turbine and of permitting a slight misalinement between the two shafts which it connects, as this may occur due to wear in the bearings of the engine. By incorporating this very flexible coupling, and particularly by arranging it on the slow-running shaft, the irregularities in the torque of the engine are very appreciably diminished by the big fly-wheel effect of the fast-running turbine rotor. The smooth running of the reciprocating engine and the propeller shaft are improved correspondingly. Thus when an exhaust-steam turbine is added to an existing plant, the increased output which is obtained with the same steam consumption can be transmitted by means of the existing propeller shaft without higher maximum stresses being produced in the material. The higher speed of the propeller shaft, due to the increase in output, rather diminishes the stresses in the shaft.

When the reciprocating engine runs reversed while the ship is being maneuvered, the flexible coupling has to transmit power in the reverse direction of rotation in order to retard or accelerate the turbine. The springing has therefore to be so constructed that it is effective for either direction of rotation.

The wheels of the reduction gear are made as single helical gears according to the standard Brown Boveri practice introduced many years ago. Compared with double helical gears these can be cut more accurately and are simpler to erect. The axial thrusts which occur with single helical teeth are balanced within the reduction gear itself by means of the patented Brown Boveri system. Thus no special thrust bearings are necessary. The thrust of the turbine rotor is balanced by the axial thrust of the pinion which is coupled to it, while the thrust block provided on this shaft serves only to take up any differences which may occur. The thrusts of the pinion and gear wheel on the intermediate shaft mutually equalize each other. The thrust of the large wheel is transmitted direct from the hollow shaft on which the wheel is fixed to the interior shaft and thence to the propeller shaft thrust block. This thrust is so directed that it opposes that of the propeller, thus relieving the thrust block of some of its load.

A diagrammatic arrangement of the control gear of a Brown Boveri exhaust-steam plant is shown in Fig. 3. As shown in the illustration, the main control lever for the whole plant is in the "ahead" position. The reciprocating engine is receiving live steam through the stop valve *b* and the exhaust steam from the engine is flowing through the pipe *c* and the change-over valve *d* to the turbine *e*, whence it passes to the condenser *f*. If the order is received to go astern, the control lever *a* is thrown over, and the loaded spring of the oil-regulating cylinder *h* thus released. The piston in the cylinder *h* now moves and uncovers the end of the oil pipe to the regulating cylinder of the change-over valve *d*. The oil under pressure above the piston of this latter cylinder can now flow back through the cylinder *h* to the oil reservoir *r*. A spring under the piston of the valve *d* changes this over so that steam can no longer pass the turbine but is by-passed directly to the condenser.

The design of the oil-regulating cylinder *h* and the manner in which it is operated is such that the exhaust-steam admission to the turbine can be opened only when the main control lever *a* is in the "ahead" position. On the other hand, the oil above the piston of the change-over valve can be run off by opening the cock *g* in a by-pass connecting the inlet and outlet oil pipes from the regulating cylinder. Thus even when the main control lever *a* is in the "ahead" position, the exhaust steam from the engine can be passed directly to the condenser. By this feature, a continuous changing over of the valve *d* when maneuvering in the harbor can be avoided.

When the control lever *a* is thrown over from "ahead" to "astern," it takes with it the lever *i* which is resting in its neutral (central) position. This moves the piston of the oil-regulating cylinder *k* so that oil can now flow under the piston of the live-steam valve *1;* this therefore opens, admitting live steam to the astern blading of the turbine, which begins to run reversed. The action in the reversed direction occurs immediately the control lever *a* is put over, i. e., a few seconds before the reversing gear of the reciprocating engine has come into effective operation and therefore before the engine has begun to run reversed. When the opposite maneuver is being made, i. e., from "astern" to "ahead," the live-steam valve *m* is opened in a similar manner by the pressure of the oil supplied to it by means of the regulating cylinder *k*, and thus live steam is admitted to the blading of the turbine. The lever *i* for supplying live steam to either the astern or forward blading of the turbine can be re-set at any time independently of the main control lever *a*, the most suitable time for doing so being when the required speed has been approximately attained. The lever *i* cannot be moved past its central position when the lever *a* is in either of the full-over positions "ahead" or "astern." It is thus quite impossible for live steam to be supplied to the wrong set of blading which would cause the turbine to attempt to run in the opposite direction to the reciprocating engine. When the ship is being maneuvered in harbors or narrow channels only a very low speed can be used and therefore low engine power is called for. At such speeds the accelerating and retarding torques of the turbine rotor are small and under such conditions the maneuvering of the turbine by live steam can be cut out altogether, which is done by disconnecting the levers *a* and *i* from each other. The maneuvers are then carried out with the reciprocating engine alone.

While being reversed the reciprocating engine requires practically no steam and therefore the live steam supply available for the turbine is not limited. In view of

Generated on 2024-09-12 14:41 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

the large pressure drop obtainable with the live steam and due to the big reduction ratio between the turbine and propeller shaft, the assisting effect of the turbine when maneuvering is very efficient.

It will be seen from Fig. 3 that a safety governor *n* has been provided on the turbine in the usual manner. When the speed exceeds a certain value the governor opens an oil valve, allowing the pressure of the oil under the piston of the quick drop valve *o* to fall to zero. The valve is then closed by a spring and the supply of live steam to the turbine is cut off. The change-over valve *d* also is operated in a similar manner and the exhaust steam from the reciprocating engine passed directly to the condenser.

All the control gear and safety mechanism is operated by the pressure oil supplied by the oil pump. The turbine plant is lubricated by oil under a static head obtained by mounting a gravity oil tank in an elevated position of the engine room hatch.

The oil pump *s* pumps oil from the tank *r* through a filter *t* and an oil cooler *u* to the container *p*. The oil pump, filter, and cooler are provided in duplicate, but for normal working only one of each is employed.

If it is desired to disconnect completely the turbine and reduction gear from the reciprocating engine, the bolts in the rear flange of the coupling between the internal shaft and the reduction gear are removed.

Summary

The development and advantages of plants in which a reciprocating engine and an exhaust-steam turbine are combined have been briefly considered. Then a description was given of the design and working of the exhaust-steam turbine plants which Brown Boveri & Company are building for two cargo vessels ordered by the North German Lloyd from Messrs. Bremer Vulkan-Werft. The distinguishing feature of the Brown Boveri design is that the exhaust-steam turbine is never uncoupled from the reciprocating engine. When reversing, the engine is aided by supplying live steam to the turbine. The uneven torque of the reciprocating engine is compensated by means of a spring coupling, which also permits the shafts to be slightly out of line.

The American Bureau of Aircraft

STRIDES of aviation in the United States in the past few years have brought to the fore the necessity for additional facilities for aircraft insurance. Underwriters interested in entering this field have requested the American Bureau of Shipping to extend its existing operations to cover aeronautics as a neutral service to connect the operators with the insurance companies. In this respect, the Bureau, fully realizing that aeronautical engineering and operation is an entirely separate and different field from any of its present day efforts, has organized, as directed at the last meeting of its board of managers, a new and separate department, the American Bureau of Aircraft, to be composed of experienced aeronautical personnel.

Not Operated for Profit

The American Bureau of Shipping is an established organization of sound financial standing, founded in 1862. It is incorporated under the laws of the State of New York with no stock and is not operated for profit to any individual or corporation. Its income is derived from classification and inspection and all accrued profits are, by its charter, devoted to the maintenance of the Bureau and the advancement of the art which it represents. The American Bureau of Aircraft, the new aeronautical department, will receive its income from its aeronautical activities and all such funds, after proper charges for expenses, will be used solely for advancing the purpose of this new art, at the discretion of its own committee. A general advisory committee is in the process of formation at the present time and will be composed of representative persons in the aeronautical industry.

Alexander Klemin, professor of aeronautics at New York University, is retained by the American Bureau of Aircraft as consulting aeronautical engineer and his broad knowledge and experience in this field will be an invaluable asset.

Member of the Aeronautical International Register

This society is a signatory member of the Aeronautical International Register (A. I. R.) and represents therein the United States. The A. I. R. is composed of the following representative societies, in addition to the American Bureau:

The British Corporation Register of Shipping and Aircraft	Great Britain
Bureau Veritas	France
Imperial Japanese Marine Corporation	Japan
Registro Italiano	Italy
Norske Veritas	Norway
Germanischer Lloyd	Germany

There is a position between the airplane builder, owner or operator and the underwriter, which a society of this nature can fill. Its function is to coordinate the relations between them and to bring about a clearer knowledge of the condition of the aircraft involved, their operation, the country over which they fly and general maintenance that will establish a better basis for the computation of the premium for the risk involved.

In addition to a very complete initial survey, a system of monthly and tri-monthly inspections and check-ups has been devised. This service is designed to benefit the owner or operator not only as a safety factor but as an aid from the underwriting standpoint.

The various ramifications of the American Bureau of Aircraft in this field cannot be given at this time in detail but the above outline readily demonstrates the purposes with which it will enter this field.

Scout Cruisers Named

ACCORDING to a recent announcement of the Navy Department, Secretary of the Navy Wilbur has assigned names to four of the new light cruisers formerly designated as Nos. 27, 29, 30 and 31 which are now under construction. These cruisers will be called the *Chester, Chicago, Houston* and *Augusta*. They were authorized in 1924 and funds for their construction were provided in the naval appropriation bills for 1928 and 1929. These cruisers have an overall length of 600 feet, an extreme breadth of 64 feet 5⅜ inches, a mean draft of 19 feet 8½ inches and a displacement of 10,000 tons.

The *Chester*, which is being built by the American Brown Boveri Electric Corporation, Camden, N. J., was 20 percent complete on July 1. The *Chicago*, under construction at the Mare Island Navy Yard, Cal., was 5 percent complete on July 1. The *Houston*, being built by the Newport News Shipbuilding & Dry Dock Company, Newport News, Va., was 21 percent complete on July 1. The *Augusta*, also being built by the Newport News Shipbuilding & Dry Dock Company, was 11 percent complete on July 1.

Generated on 2024-09-12 14:15 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

Plan to Use Echoes in Making Maps of Oceans

COMPLETE maps of the seven seas of the world, showing the hills and valleys of the ocean beds as thoroughly as is now done on land, will be undertaken by the International Hydrographic Bureau if the latter adopts the proposal submitted to it by G. Renius, the Swedish hydrographer. Mr. Renius points out that by use of echo-sounding apparatus it is possible to draft the contours of land beneath the seas with complete accuracy. Maps of this kind will enable ocean liners to make use of landmarks under the water for safe navigation in the same way that aviators now follow the courses of rivers, mountains or railroads.

Mr. Renius' proposal was made after a voyage on the S. S. *Columbus* of the North German Lloyd Line, which is equipped with a fathometer. This instrument which is manufactured by the Submarine Signal Corporation, Boston, Mass., measures, through the most accurate method yet devised by science, distances under water as great as three miles. This is accomplished by calculating the elapsed time between an electrical sound and return of the echo, which is translated automatically into fathoms on a clock-like dial. Mr. Renius points out that ships will be equipped with similar instruments in rapid succession, thus permitting the mapping of ocean lanes through coordination of this information through the International Hydrographic Bureau as a clearing house. His statement follows:

"It will soon happen that the large liners will be successively supplied with echo-sounding apparatus, and consequently their routes or routes-zones will, in course of time, be sounded to a hitherto unknown density. In order that these soundings may be of the largest possible use to navigation in general there will be need for a central international organization which should try to stimulate the respective companies to take such soundings as well as, later on, to send in the results to appropriate hydrographic offices or to the bureau.

"For states which publish charts of the whole world, the results might be sent in by the respective companies to the national hydrographic office, but for other countries it would be simpler, without doubt, to send echo-sounding results to the bureau, to be distributed to those countries which publish charts of the areas concerned.

"To give real value to these results coming in from varying sources it would be necessary to recommend certain standards regarding the sounding work, and to lay down the additional information which should accompany the data.

"Regarding the rest of the merchant marine, the arousing of interest in practical participation in this work might very well be postponed for the present.

"On the contrary much valuable aid might be counted on from all *naval vessels* making expeditions every year. These vessels have considerably greater liberty in choosing their routes on the oceans, and thus our knowledge of the depth conditions within areas alongside or between the liner tracks might be completed later on. However, it must evidently be assumed that the work will be systematic and planned internationally if the results are expected to be at all fruitful within reasonable time.

"If it be possible to carry out this proposal, it must necessarily be taken in hand by the bureau. The beginning might be made on a comparatively small scale, and, after gaining the necessary experience, a final scheme, which is capable of being successively enlarged, may be put into operation.

"Perhaps it may be possible for the bureau to consider this question, in its various aspects, more thoroughly than has been feasible here and, eventually, to place the question before the conference in 1929.

"The task may possibly seem alarmingly large, but with support from the hydrographic offices interested, this purely hydrographic question might certainly reach a practical and fruitful solution."

Metallization Obtained by Brush Application

A PROTECTIVE material now extensively used in Europe is being introduced in this country. The trade name of Subox is given to this product which is apparently a paint but is actually a process of metallization. This product is distributed in this country by Subox, Inc., 220 Church St., New York City.

Subox is not produced by grinding, as in the case of most paints, but is a chemical product, suboxide of lead (Pb_2O) formed through an electro-chemical process which releases the particles. The pigment particles are mostly colloidal in size, being about 1/16 the size of the particles of ordinary red lead, and can therefore be suspended in the vehicle of linseed oil.

Subox may be applied like an ordinary paint but, due to its fine structure, a given amount will result in a large covering capacity. Through exposure, the oxygen in the compound is absorbed by the linseed oil and lead oleates are formed, disengaging metallic lead which acts as a filler and sealer of the metal surface.

In any case of application, Subox must be allowed to stand in ventilation for about three months in order to obtain the best results. Unless this chemical action can take place, which requires time and oxygen, Subox does not metallize and therefore does not give the full protection against salt water, sulphur and ammonia fumes, corrosion and general deterioration.

In new construction where steel plates will be thoroughly ventilated for a considerable length of time, such as in new ship work on the ways, Subox should prove satisfactory as a priming coat.

Standard Oil Boats Now Completely Dieselized

THE *Utica* and *Albany Socony*, of the fleet of the Standard Oil Company of New York, will be completely equipped with Diesel engines for both propelling and auxiliary units when they leave the yard of W. & A. Fletcher Company, Hoboken, N. J., where the installation is now being completed of engines supplied by the Standard Motor Construction Company of Jersey City.

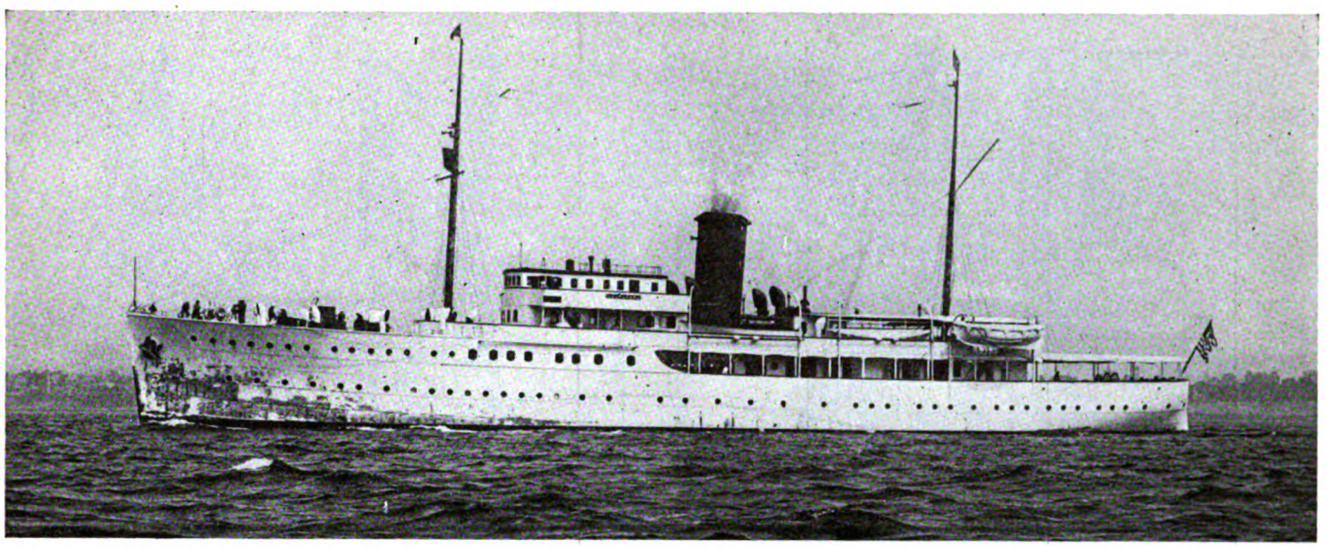
Each boat is being equipped with a 6-cylinder 220-horsepower direct reversible Standard Diesel engine for propulsion, one of the new 4-cylinder 6-inch by 8-inch Standard Diesel engines driving a 25-kilowatt Diehl electric generator and a similar engine driving a pump.

This new engine is the most recent model developed by the Standard Motor Construction Company. It is designed for yachts, work boats and auxiliary drive and is a full Diesel operating with solid injection. The new engines run at 600 revolutions per minute and occupy the same space as the former Standard gasoline engines. They are the first of the new type to be delivered.

Institution of Naval Architects Buys New Home

The Council of the Institution of Naval Architects has acquired two houses in Adam Street, Adelphi Terrace, London, as a permanent home for the Institution. The address of the new home is 2, Adam Street, Adelphi Terrace, London, W. C. 2.

Generated on 2024-09-12 14:15 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN



New sea-going Diesel yacht Nourmahal

Sea-Going Diesel Yacht Nourmahal

Electrically-driven auxiliaries featured in new Astor yacht—System developed to maintain constant draft

By Harold M. Wick*

LIKE other yachts bearing the same name that have been constructed for the Astor family in years past, the new *Nourmahal* that has been built for Vincent Astor, commodore of the New York Yacht Club, is radically different from the usual types of large sea-going yachts known to the yachting fraternity of this country.

The *Nourmahal* was constructed by Messrs. Fried. Krupp Germaniawerft of Kiel-Garden, Germany, and was designed by Theodore E. Ferris, naval architect and marine engineer, New York, while the construction was supervised by James K. Ingham of Mr. Ferris' staff. Cox & Stevens, naval architects, of New York, cooperated in the design, having charge of the plans for the interior work pertaining to the owner's and guests' accommodations.

Following are the main particulars of the yacht:

Length overall	263 feet 10 inches
Length between perpendiculars	250 feet
Beam, molded	41 feet 6 inches
Depth, molded to main deck	25 feet 7 inches
Gross tonnage	2,000
Net tonnage	1,200
Horsepower	2,600
Fuel oil capacity, tons	513
Fresh water capacity, tons	253
Cruising radius, nautical miles	16,000

A feature of the new *Nourmahal* design is a straight stem which has been substituted for the usual long sweeping bow. Another evidence of practical sea-going experience on the part of the designer and the owner is seen in the adoption of a cruiser stern. These details add much to the seaworthiness of the vessel, which has been planned for ocean-cruising and long voyages where easy sea-riding abilities are necessary for the comfort of the owner and guests.

The *Nourmahal* is of large displacement and is subdivided with watertight bulkheads in excess of a two-compartment vessel, making her practically unsinkable and absolutely safe in case of collision or other damage. She is uniquely balanced by means of independent fuel oil and water ballast tanks in order that a uniform metacentric height and constant load draft can be maintained. Her construction is unusually heavy and staunch in every particular. The Diesel engines are balanced for smooth running, special foundations having been provided to avoid vibration.

Develops Sixteen Knots on Trials

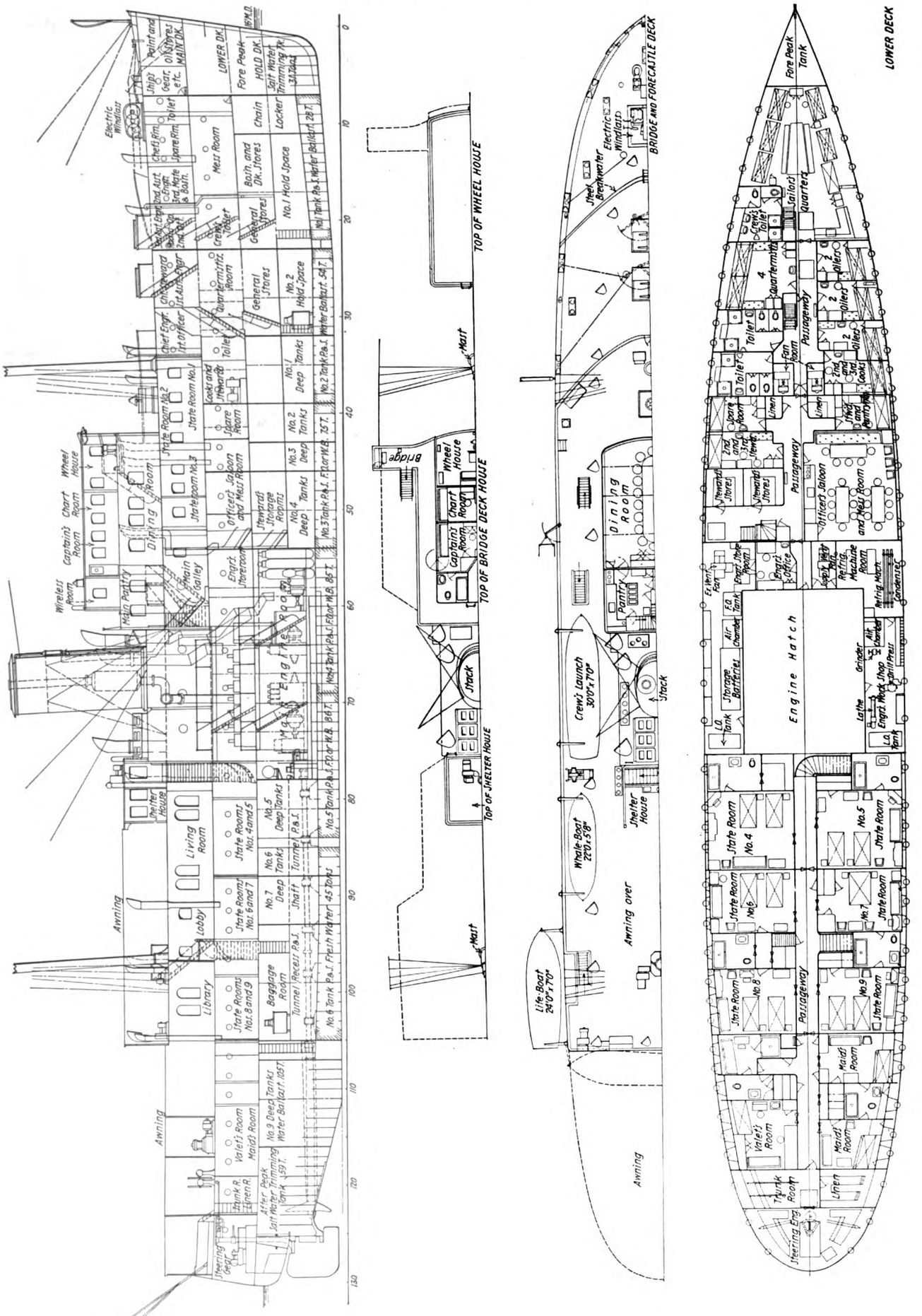
Before leaving the Krupp yard several official trial trips were run to test the propelling machinery and auxiliary equipment. During these runs the yacht proved to be vibrationless at all speeds and exceeded her speed and horsepower guarantees, making a speed of 16 knots and developing about 3,200 horsepower.

The vessel was constructed under specific guarantees by the builder as laid down by the owner's naval architect. Among these were guarantees on the equipped weight for light displacement, the vertical center of gravity, the longitudinal center of gravity, a six months' guarantee against development of defective workmanship and material, the horsepower developed by the main engines, the speed, and the fuel consumption. In connection with the latter, it is expected that the fuel consumption of the main engines and the necessary auxiliaries operating with them at normal power will not exceed 0.44 pound per brake horsepower per hour, when using fuel oil suitable for Diesel engines, and that the lubricating oil consumption will be about 0.0045 pound per brake horsepower per hour at full load.

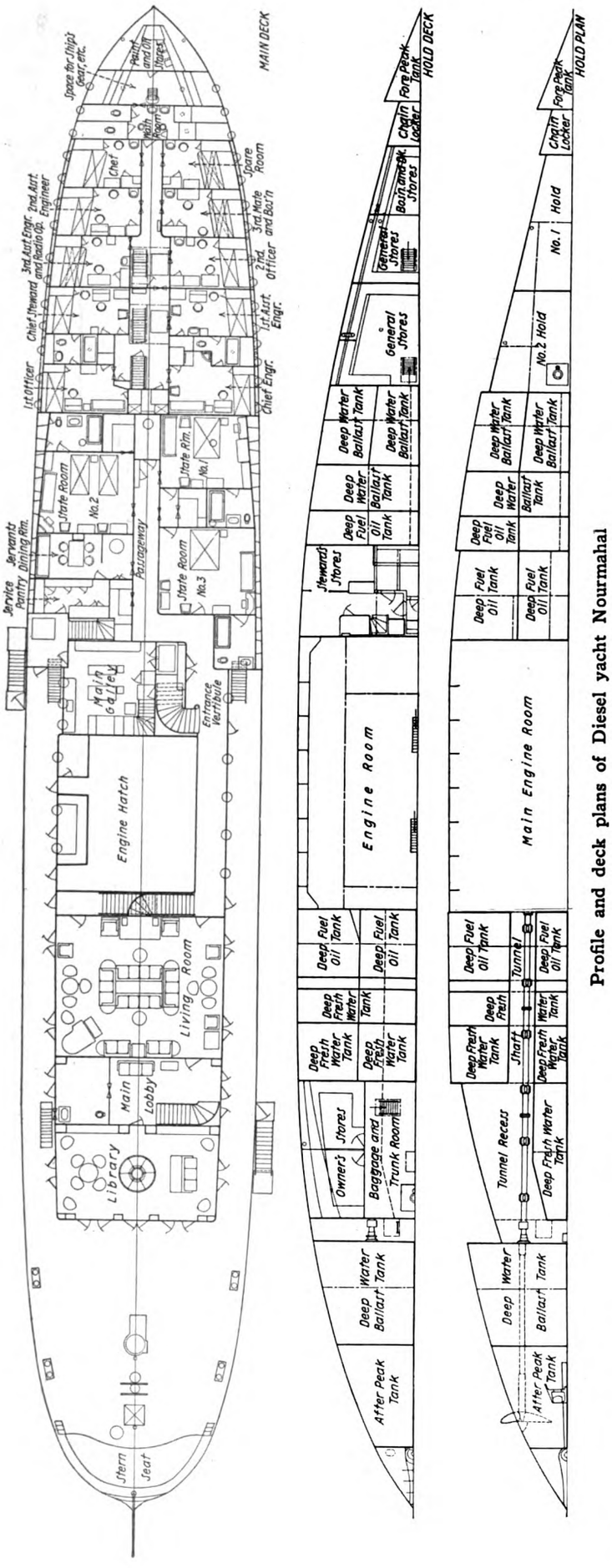
In order to obtain a powerful and comfortable sea-going vessel within the dimensions, a high volume of displacement was adopted with the intention of loading the vessel as much as possible. There are about 700 tons of changeable load, made up of fuel oil, fresh

*Of the staff of Theodore E. Ferris, naval architect, New York.

Generated on 2024-09-12 14:58 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN



Generated on 2024-09-12 14:14 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN



Profile and deck plans of Diesel yacht Nourmahal

water, water ballast, stores, owner's and guests', baggage, crew and effects. The fuel oil, fresh water tanks and salt water ballast tanks are arranged for independent use, with the exception of certain of the double bottom tanks which are used for either fuel oil or salt water ballast. This arrangement of tanks has been planned with a view that as far as practicable when the vessel is used in normal short run cruises a small amount of fuel oil and fresh water may be carried with a large amount of water ballast. However, when it is intended to make a long non-stop voyage, a large amount of fuel oil and fresh water with a small amount of salt water ballast will be carried. As the fuel oil is consumed during the progress of the voyage, the salt water ballast tanks will be filled. In this way, for any service of the vessel, an almost constant load draft of about 16 feet and a constant metacentric height can be maintained by judicious manipulation of the tanks, so that the yacht will have the best sea-going qualities at all times.

Bulkhead Arrangement

The bulkheading and sub-divisions of the yacht have been laid down to meet the requirements of a two-compartment vessel, based on the rules of the British Board of Trade, in order to get the greatest degree of safety possible in case of collision or other accident. There are eight main transverse bulkheads, three of which extend up to the bridge deck and five up to the main deck, stepped where required to suit accommodation arrangements and machinery spaces. These eight transverse bulkheads provide for seven longitudinal compartments, exclusive of the fore and after peaks.

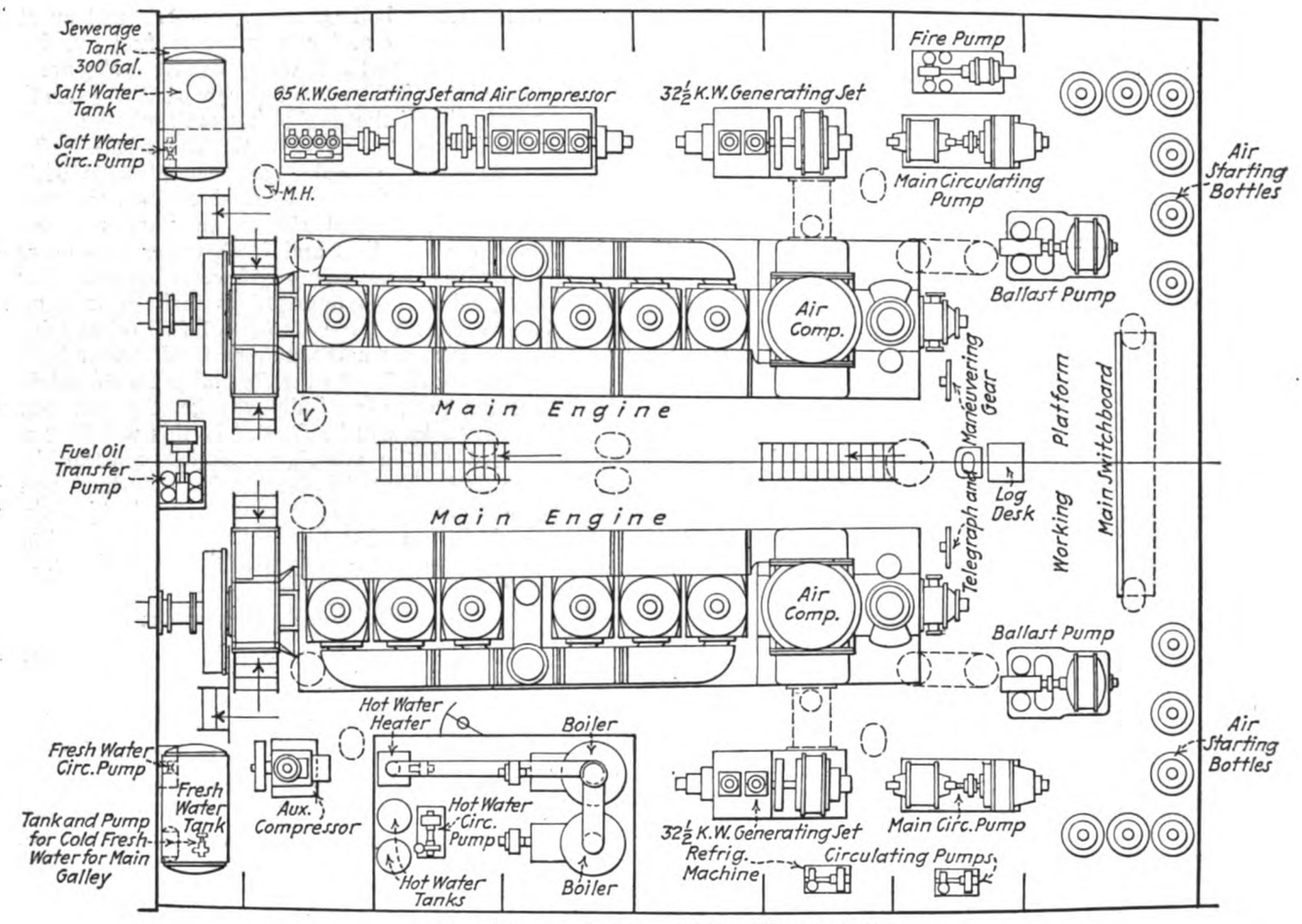
Additional partial bulkheads extend up to the lower deck, forming built-in deep tanks, which are used as separate and independent tanks for fuel oil, water ballast and fresh water. To prevent too much free surface, these deep tanks are divided by oil-tight and water-tight bulkheads and are also fitted with longitudinal swash bulkheads open at the bottom for the free passage of water from one side of the tank to the other in case of collision and taking water, thus maintaining the best degree of stability possible under all conditions. Where any of the main transverse bulkheads are pierced for doorway, etc., such doors below the bulkhead deck are sliding, power operated water-tight doors worked from the bridge.

The vessel was built under special survey of Lloyd's Register of Shipping covering workmanship and all materials and equipment. In addition, the vessel has been constructed and equipped so as to comply with the rules of the United States Steamboat Inspection Service and the Public Health Service requirements as to the segregation of drinking, cooking and washing fresh water.

Features of Hull Construction

The hull is almost entirely shaped with very little flat side. The straight merchant ship stem is in two sections, of cast steel, while, with the cruiser type stern, the stern frame is in three sections, of cast steel. The stern post and lower

Generated on 2024-09-12 14:20 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN



Plan of the engine room of the Nourmahal

section are of trough section with stiffening webs. The frames are bulb angles beyond the margin plate, spaced 24 inches center to center throughout, including peak tanks. The keel is of the flat plate type. The rudder is of the balanced type and a cast iron tiller is provided, fitted with tackle and gear, for use in case of breakdown of the mechanical means of steering. Bilge keels of the wedge type are fitted at the turn of the bilge for about 100 feet amidships.

The deck houses are all built of steel. In order to stiffen the deck house and provide against movement in the main deck house, light steel athwartship bulkheads have been fitted; one in conjunction with the forward end of the engine casing, another aft of the main stairway, one aft of the engine hatch, one between the living room and lobby, and one between the lobby and library. Also in the bridge deck house, a similar steel athwartship bulkhead is fitted between the dining room and pantry. A fore and aft steel bulkhead encloses the pantry in steel, and the galley and serving pantry together are enclosed in steel.

There are three sewage tanks of 300-gallons capacity each, constructed of galvanized steel, one being located in the No. 2 hold, one in the after end of the engine room on the port side, and one in the trunk and baggage room on the hold deck above the No. 8 deep tank. These tanks are arranged to take the sewage from all parts of the vessel. Waste pipes are trapped before entering the tanks and the tanks have cocks for inserting disinfecting fluid and manholes for cleaning, and air vents carried up with outside vents. Each of these tanks is fitted with a vertical centrifugal single stage sewage pump, all bronze, with a 2½-inch suction and 2-inch discharge. The pumps are suspended from the steel covers on the tanks and submerged in the tanks close to the bottom. The pumps are driven by one-horsepower electric motors located on top of the tanks on the tank covers. Practically all the plumbing, such as tubs, sinks, showers, closets and other fittings, were bought in this country from the J. L. Mott Company and shipped to Germany for installation.

The vessel is heated with a hot water system throughout, supplied in duplicate. For this purpose there are two oil-burning, low-pressure boilers, with about 25-inch fire-boxes, located in a fire-proof and gas-tight steel enclosed room in the engine space, starboard side. For circulating the hot water, each boiler is fitted with an electrically-driven centrifugal circulating pump, located close to the boilers. The radiators in the owner's and guests' staterooms and living quarters are recessed into the panel work and concealed with decorative metal grilles.

Also located in this fire-proof room in the main engine room are two 150-gallon copper tanks to hold the hot fresh washing water, these tanks receiving their water from the main washing water storage tanks through the hot water circulating pump. These tanks are automatically controlled so that there is a pressure of about 40 pounds per square inch at all times. The heating element for the hot water is a fire-proof box containing a coil for heating the water, the heat being supplied by an oil-burning system.

All owner's and crew's rooms, passageways, toilets and bathrooms, galley, pantry, etc., are mechanically

Generated on 2024-09-12 14:19 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

ventilated. The supply and exhaust system has been adopted and a complete change of air is secured throughout, every three minutes. The supply and exhaust fans are electrically driven. The air ducts are constructed of heavy galvanized iron. The supply fans are placed on the starboard side and the exhaust fans on the port side. Six ventilating fans are exposed to the weather, three supply and three exhaust fans being located on the bridge deck aft of the engine hatch. The other fans are below decks. The galley is ventilated by an exhaust fan giving a change of air every three minutes.

Propelling Machinery

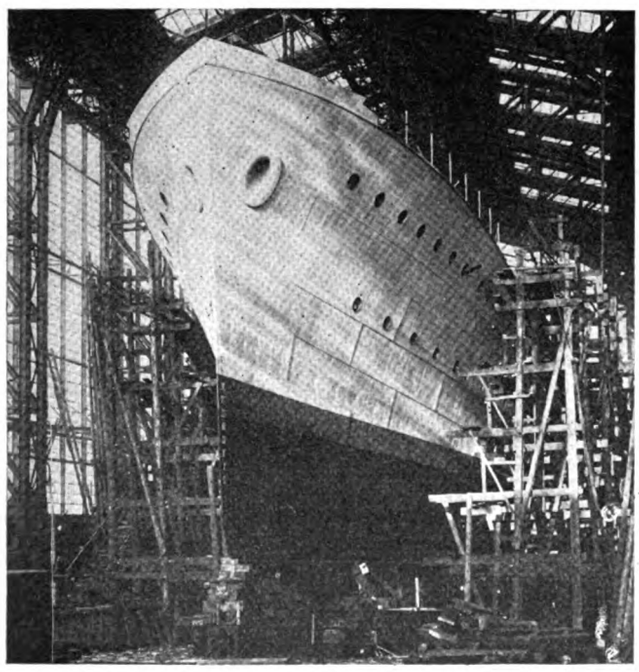
A twin-screw arrangement with two main engines of the Sulzer vertical six-cylinder, single-acting, two-cycle, reversible Diesel heavy oil engine type constitutes the main propelling machinery. The main engine cylinders are 18½ inches in diameter, with a stroke of 32½ inches. Each engine gives a continuous normal output of 1,300 brake horsepower at 145 to 150 revolutions per minute and is capable of developing 1,600 brake horsepower, as proven on the trial trips. One multiple-stage air injection compressor and one scavenging air pump, together with one lubricating oil pump, are attached to each engine, and are direct driven from an extension to the main crank shaft. There are 12 engine air-starting bottles.

Generating Sets Are Diesel Driven

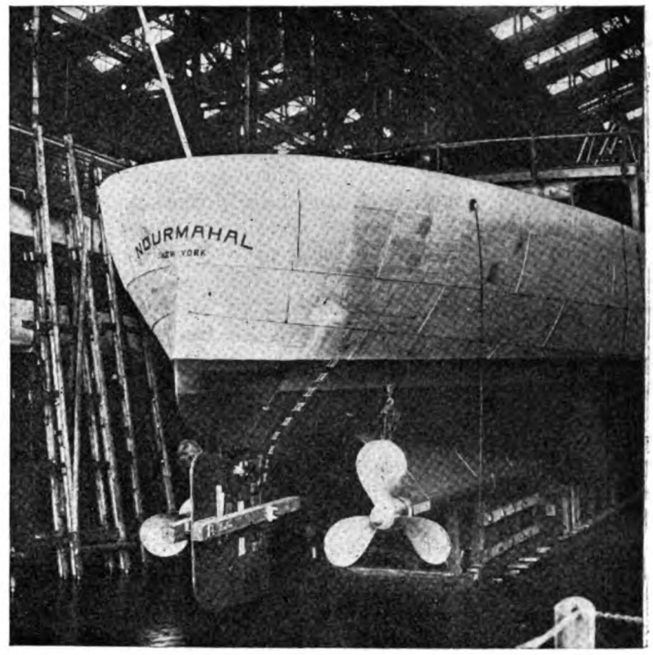
Located in the engine room are a 100-brake-horsepower and two 50-brake-horsepower Sulzer, two-cycle, airless injection, crosshead type Diesel engines driving a 65-kilowatt and two 32½-kilowatt, 110-volt, direct current, compound wound generators respectively. A two-stage air compressor with a capacity of 4,900 cubic feet of free air per hour is arranged for direct-coupling to the 100-brake-horsepower engine and is mounted on the same bed plate as the generator driven by this engine.

Auxiliary Equipment

An auxiliary air compressor is installed in the engine room, with a two-cycle, hot bulb engine of 3 brake horsepower. In addition, there are two main circulating pumps, a ballast pump, two bilge pumps, a fire and general service pump, a fresh water pump for washing water, a fresh water pump for drinking and cooking water, a fresh water circulating pump for hot washing water, two refrigerating machine circulating pumps, a scuttle-butt circulating pump, a fuel oil transfer pump. All of this pumping equipment is motor driven, which is also the case with the remaining auxiliary equipment about the vessel. There are two main engine exhaust mufflers and four auxiliary engine exhaust mufflers. There are two lubricating oil coolers and two lubricating oil separators or purifiers.



Bow view



Stern view

There are two 2½-ton compressors of the direct-expansion ammonia type, each being driven by a 5-horsepower electric motor. Condensers, receivers, oil interceptors, gage boards and condensing water pumps are also included in the cold storage system. This machinery is located on the engine-room flat and is completely enclosed in steel and made gas-tight. In addition there are brine congealing tanks in the storage boxes, scuttle butt and pump, etc., to make the system complete. The steward's cold storage boxes contain about 2,000 cubic feet of refrigerated space. Ice-making cans with a capacity of 200 pounds in 25 hours have been provided.

The anchor windlass for handling the two anchors is electrically operated, as is also the capstan aft on the main deck. Both have cam control and magnetic brakes. Electric motors on the port and starboard sides of the bridge deck are provided for hoisting the launches and other boats. The steering gear is of the electric-hydraulic type, directly connected to the rudder stock. An electric helm-angle indicator in the wheel house registers the rudder position.

Two specially built fast launches are provided for the use of the owner, a crew's launch, a whaleboat equipped with a motor and electric starter, and two 24-foot metal lifeboats, all hung on swinging type davits, comprise the small boat equipment.

The navigating equipment includes a magnetic compass, and a Sperry gyro-compass. In order that guests may watch the operation of the master gyro, it is

Generated on 2024-09-12 14:18 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

mounted in a small room off the passageway to the owner's quarters. This room is provided with a large plate glass window. From the master gyro-compass true north indications are sent electrically to various repeaters, which include a steering repeater, a bearing repeater, located on the open bridge, a 30-day continuous course recorder, and a repeater for permitting true bearings to be taken with the radio direction finder.

A gyro-pilot, or automatic steering equipment is also provided, which is a triple-steerer type recently developed by the Sperry company for yacht use. The control, or steering unit acts as an electric telemotor system as well as an automatic steering system. The power unit of the gyro-pilot is mounted in the steering engine compartment and actuates the control of the Hastie hydro-electric steering system. As an emergency, in case the electrical supply to the gyro-pilot fails, there is a hand wheel which, by means of shafting and rope control, operates directly the throttle valve of the hydro-electric steering engine.

A Kolster radio direction finder is part of the yacht's navigating equipment.

The Lux system of fire protection is provided in the engine room, galley and lamp room. A system of fire alarm gongs is also installed through all owner's and guests' accommodations and the crew's quarters.

Intercommunication Systems

A bell call and annunciator system with push buttons in all owner's and guests' staterooms and living rooms, and outside deck spaces, is provided. There are two separate systems of telephones, one being a loud speaking system for the officers, and the other a general service system for the living quarters. A complete radio transmitting and receiving outfit and broadcasting receiver, were supplied by the Radiomarine Corporation.

Storage batteries are used to supply current for electric light and small power units while the yacht is at anchor or at dock. These storage batteries are located in the engine room and are of the Edison type consisting of two 100-cell type A-8, with a total capacity of 800 ampere-hours. An electric filling device and tank is also provided. Emergency lighting storage batteries of the Edison type are located in the wireless house and have a capacity of 19 ampere-hours, sufficient to take care of 40 lights of 45 watt capacity each.

Living Quarters

In the living quarters nine very large luxuriously fitted-out staterooms are provided for the owner and guests. These rooms have twin, double or single beds, all with connecting bathrooms and large wardrobes. Three of these rooms are located on the main deck and six on the lower deck. A very spacious living room, a library, dining room, a deck shelter house, and sun deck spaces comprise the general living quarters. There are also adjoining rooms for valets, maids, pressing room, etc. The furniture for these rooms was bought in England and installed at Southampton after the vessel left the shipyard at Kiel.

The living room, located aft of the engine room hatch in the main deck house, is larger than is usually found in the average home, being 25 feet by 28 feet. A real fireplace equipped to burn coal or wood is to be found at the forward end of this room with an artistically carved wood mantel, and having its own stack or chimney. This room being the main lounging space on the yacht, is fitted out with a number of large sofas, deep arm chairs, fine rugs over parquet flooring, rare paintings, tables, an electric piano, electric phonograph, and radio broadcast receiver. The room is lighted by large bronze framed windows swinging outboard and hung with fine draperies. All the radiators are enclosed in metal grille work.

The library is located in the after end of the main deck house and is 16 feet long by 28 feet wide. The walls are lined with bookcases having glass doors fitted with artistic panels. The deck in this room is also laid with parquet flooring covered by heavy rugs. The room is finished in panel work of white pine with a special "pickle pine" finish. Deep lounging chairs and sofas and small tables comprise the furniture in this space. The windows in this room are large bronze framed units hung with rich draperies, and the radiators are recessed into the walls and enclosed with artistic metal grilles.

The dining room is 27 feet by 20 feet, located on the bridge deck, and is fitted with a large table, chairs, serving tables, built-in sideboard, silver lockers, etc. The walls and ceiling of this room are finished in a panel effect and the deck is laid with parquet flooring and rugs.

The main pantry is just aft of the dining room and is fitted with steam tables, toasters, refrigerators, hot water and coffee urns, an ice cream cabinet, sinks, dish racks, etc. The main galley is on the main deck immediately below the pantry and a dumbwaiter connects these two working spaces. A large coal-burning range is fitted in the galley, together with dressers, working tables, steam kettles, ice cutter, etc. A small entrance lobby with a stairway from the main deck is located just aft of the dining room and is finished in hard wood panel work of walnut.

There is a special dining room for the servants, one for the ship's officers, and others for the crew. There are two large trunk and baggage rooms.

The main lobby is located between the living room and library with a stairway from the lower deck, fitted out with a large sofa, tables and chairs, and a fish rod closet, coat closet, and finished in full-height panel work.

A crew of 18 men is carried in the deck department, 12 in the engine department, and in the steward's department from 12 to 20, depending on the number of guests.

Todd Powdered-Coal Burner

THE Todd Shipyards Corporation of New York has developed an improved type of pulverized-coal burner for marine use. This has been accomplished by the engineers of the Tebo plant of the corporation in Brooklyn, N. Y., where a series of experiments have been made during the past two years. A demonstration of the new burner has been given for the benefit of members of the fuel conservation committee of the Shipping Board and plans for the installation of the apparatus for a test under actual service conditions are now under way.

The Todd system takes the coal from hoppers where it is stored after being broken up by a crusher. The crushed coal is fed by gravity to pulverizers attached to each furnace, where it is ground so fine that it will pass through a 200-mesh screen on its way to the burner. An individual pulverizer is used for each furnace and by this means the difficulties met in multiple distribution are eliminated.

The coal is drawn from the pulverizer into the

Generated on 2024-09-12 14:16 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

burner by means of a fan which will pick up the coal that has been ground to the required degree of fineness. The burner is an adaptation of the Todd oil burner.

At the present time, a steam turbine is employed to operate the individual pulverizers but experiments will be made in which a small electric motor will be substituted for the turbine.

The outstanding feature of this device is its compactness. It is small enough to be installed not only in any space that is given over to the boiler room aboard larger ships but also in small tug boats as well.

Suggestions For Licensed Engineers on Shipboard

A practical study program—What and how to study

By David Gaehr*

IN looking ahead as to the best way to go about improving one's mind, professionally and otherwise, it is well to make a survey of the methods of procedure and of the various aids available. There are many methods for acquiring useful information. Some are good. Some are fair. Some are decidedly bad and even bound to stunt intellectual development.

A glaring example of the latter method is the presentation of disconnected facts, without reasoning back to fundamentals and without logically classifying or grouping the facts presented. The result of using such a method is that the memory is unduly taxed and the habit of study, of reasoning and discriminating will probably never be cultivated. "Questions and answers" usually come under this category, although this form of presentation appeals, more than any other, to the average marine engineer. A few timely questions usually arrest his attention and any kind of an answer, as long as it is in neatly printed form, is usually accepted without inquiry as to who gave the answer or what his qualifications are that make his utterances worthy of acceptance. One who is charmed by the "question and answer" method is in a bad way, for he is unable to put his own need for information into intelligent questions and must have some one tell him what he wants.

Fundamental Laws Must Be Understood

A far more effective method of presenting (and acquiring) information is one which stresses fundamental laws and induces the student to find his own answer by making proper deductions, thus stimulating the cultivation of good reasoning processes. Inasmuch as the average man's capacity to memorize is limited, it is obviously far more advantageous to follow a system of studying and remembering *fundamentals,* in logical order, as from these he will be able to reason out and solve any question, old or new, coming up in connection with his work.

The attitude of accepting without challenge any technical information (just because it is published) on the supposition that "they would not dare to print anything which is not true" is unworthy of an American marine engineer, who must be capable of solving, resourcefully, any problem which presents itself in line with his work. To be sure, the competent engineer always gratefully receives any helpful suggestions offered, but he invariably makes sure of the authority of anyone making an important statement, which he may not be in position, at the time, to check up.

Reliability of Information Important

In scrutinizing the reliability of information, it will be found that the publications of our Government, of the leading technical institutions and of publishing houses like the one issuing *Marine Engineering and Shipping Age* are edited by men of such thoroughgoing training and experience as to "know what they are talking about."

Because an engineer's duties are frequently exacting, so that most of his time "off watch" must be devoted to needed rest, it is important that he be "fastidious" as to what he reads and studies. He must make a specified time allowance for systematic study of the technical phases of his chosen vocation, even though he has the highest "ticket" obtainable, or is the happy incumbent of the "finest berth in the line." Most men, in the struggle for the knowledge which enabled them to secure their licenses, studied under "high pressure" and much of the information so acquired, after seeing them through the examination, is likely to have been forgotten. Therefore the time to be devoted to professional (or vocational) studies should be apportioned partly to a review of important information which may easily be forgotten in the stress of everyday work and partly to reading about new developments and about "what's going on."

Mechanics and Heat

If the previous struggle for mastery of technical details has left the engineer with the ever-recurring query "Yes, but *why,*" it might be well to study mechanics and heat in some good textbook on physics, such as the following:

"Elementary Practical Mechanics," by J. M. Jameson, published by John Wiley & Sons, Inc., New York.

"Industrial Physics," (in two volumes: Volume I, Mechanics; Volume II, Heat) by L. R. Smith, published by McGraw-Hill Book Company, Inc., New York.

"Practical Physics," by G. M. Hobbs, published by the American Technical Society, Chicago, Ill.

"First Course in Physics," by Millikan & Gale, published by Ginn & Company, New York and Chicago.

Any of these books are free from the use of advanced mathematics and can be readily understood by men of such limited training as most marine engineers have had.

Then, it will be well to write to the Superintendent of Documents, Government Printing Office, Washington, D. C., for a copy of the latest catalogue of Navy publications, in which are listed various excellent booklets (which can be secured for very little money) covering engines, boilers, pumps, electrical equipment, refrigerating apparatus, etc.

These booklets lend themselves readily for such a study program, as an allowance can be made for covering each book within a certain time limit. Such a plan should be conscientiously adhered to; only in this way can definite progress be assured.

While studying, liberal use should be made of a colored pencil, for underlining points the reader wishes to remember and to which he may wish to return frequently. Often it is well to make new references in the index.

A Note Book Is Indispensable

So much knowledge is required in the work of a marine engineer that it is a hopeless undertaking to

*Instructor, Lake Carriers' Association School of Marine Engineering, Cleveland, Ohio.

Generated on 2024-09-12 14:54 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

try to remember it all. Essential fundamentals must be remembered; other information must be readily available and systematically filed. Since it is impossible for an engineer to carry a library around with him, he must reduce all needed information to the most condensed form, in which connection a loose-leaf note book is almost indispensable.

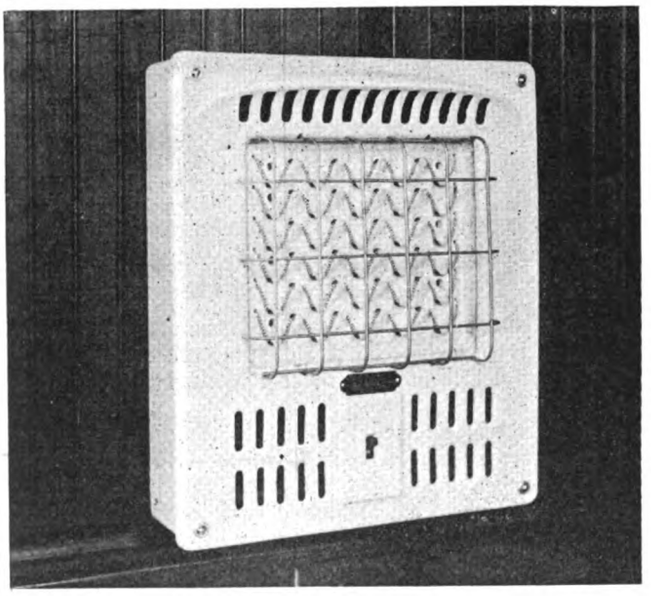
After getting a good start in acquiring trustworthy information and after learning how to apply this to advantage, the engineer will be in position to read and understand more advanced books on engineering, many of which are always available in the public libraries. Many such books are intended only as "reference works" in which to obtain helpful suggestions, when trying to solve puzzling questions. Some of these will be referred to in later contributions.

In considering a course of study it should be remembered that first must come the realization of the need for more knowledge; next, the determination to strive for it; then, a workable plan to which definite time must be given, so that definite ground can be covered in a specified time allowance.

Success to all who will thus advance themselves!

Electric Stateroom Heaters

ORIGINALLY developed for home installation, the Solar Glow electric heater has now been adapted to marine service for room heating by the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa. The same principles of heat distribution, namely, convection and radiation, have been



Marine type solar glow heater

embodied in the new marine type of wall heater and, in addition, non-corrosive parts have been used throughout in its construction.

The marine type electric Solar Glow consists of a metal box cadmium plated which can be either mounted flush with or on the surface of the cabin wall, a porcelain refractory brick heating element that slides into the box, and a white or cream-enameled cast iron front frame provided with a monel metal guard over the element. All metal parts with the exception of the element wire which is nichrome are either made of monel metal or brass.

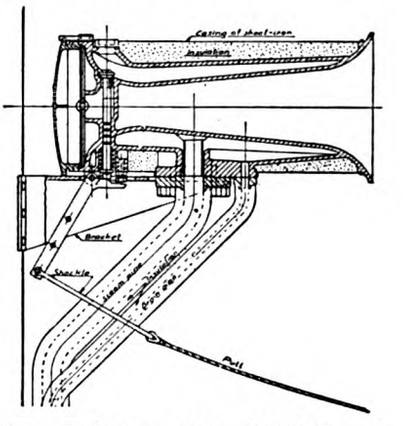
When the switch is turned on the glowing resistance wires throw out a strong beam of heat, warming the area immediately in front of the heater, similar to the heat rays of the sun. At the same time a portion of the heat is conducted through the refractory porcelain brick to an air space that has been provided in back of the element and a draft is started through the heater. As the air in back of the element is heated it rises out through vents in the top of the front frame. Cold air is then drawn in through the bottom vents, and, passing up between the box and the element is heated and forced out at the top. In this way circulation is effected and the entire room is heated in a comparatively short time.

The Solar Glow is built in any wattage desired from 660 to 3,500 and is controlled by either a tumbler or 3-heat reciprocating switch.

The Tyfon

THE Tyfon, a new type of sound signalling apparatus, has been developed by Kockums Mekaniska Verkstads Aktiebolag, Malmö, Sweden, and differs from the steam whistle of ordinary design by operating under a new principle.

When the valve is opened, the steam enters the pipe causing the diaphragm to vibrate. This vibration sets up sound waves which are magnified in their passage through the horn. At each vibration of the diaphragm, the inlet pipe is opened and closed completely.



The Tyfon is steam jacketed and insulated

All the units are made of bronze, copper or non-corrosive steel. The diaphragm is fixed by means of an easily removable ring, fitted with a ratchet, and can therefore be quickly replaced.

The Tyfon has many interesting features. Its audibility is five to six times greater than that of an ordinary whistle and its tone is of an eminent clearness. It sounds immediately and with full strength. This is possible because the Tyfon is double-walled and the inter-space forms a steam jacket, which serves the purposes of keeping the Tyfon sufficiently warm and preventing the condensed water escaping through the projector.

The Tyfons are distinguished by a very high degree of efficiency. At the same power of sound of other whistles, the steam consumption is only 1/5 to 1/30 that of whistles and sirens.

In addition to the steam Tyfon, and the air-operated Tyfon, that has found favor with the Shipping Board, an electrically automatic Tyfon has been developed to eliminate the cord operation and give a prolonged blast every second-minute in case of fog.

These devices are distributed in this country by Nils F. Nord, 74 Trinity Place, New York.

Generated on 2024-09-12 14:20 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

Paint Spraying Process

THE mechanical system of painting, developed by the Dunn Painting Machine Company, New York, reverses the customary sequence of mixing and spraying operations as employed in the two-line spraying system where the paint is broken up at the spraying nozzle by means of cross air currents from an air line. In the Dunn process atomization of the paint is accomplished first. Then the paint is conveyed in its atomized form to the gun, which controls solely the speed of application.

The operating principle of the Dunn machine is best visualized when compared to the familiar operation of an automobile carbureter. In Fig. 1 the Dunn atomizing chamber, which corresponds to the carbureter, is shown at (10). To this atomizing chamber are conducted paint and air through lines (9) and (12) respectively. The thoroughly atomized mixture of paint with air then enters the hose line (8) through which it travels in suspension to the nozzle in the operator's hands. This nozzle, or gun, performs no other function than that of controlling the speed of application and the width of spray. Adjustments to accommodate various kinds and thicknesses of paint may be made at the air shut-off valve (1) and the atomizer adjusting rod (13). Thorough and constant mixing of paint in the container to prevent precipitation of pigment is accomplished by the agitator (6) which is supplied with air by line (7). When not required, the agitator can be shut off at the 3-way inlet valve (4).

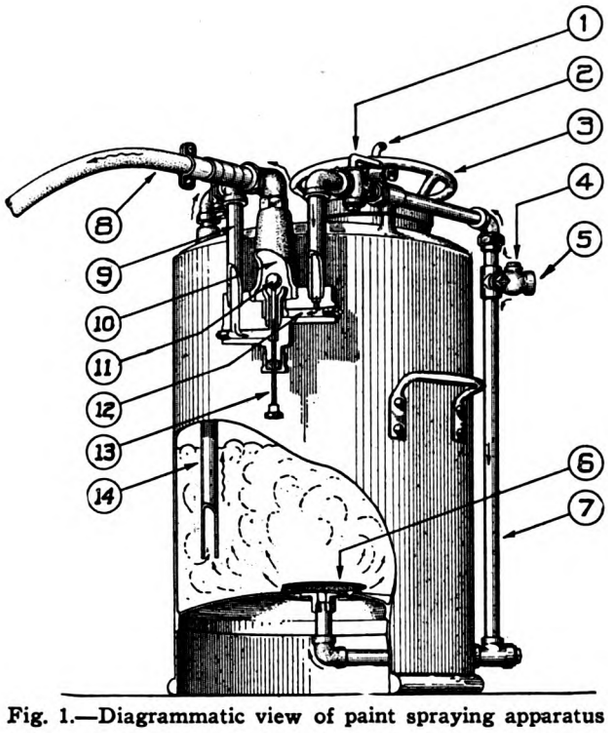


Fig. 1.—Diagrammatic view of paint spraying apparatus

A smaller size spraying machine, known as the BB type, is also available. The mechanical operation of this machine is identical with that of the larger size, except that the atomizer is a part of the removable head.

A short time ago the Shipping Board conducted tests at the Simpson plant of the Bethlehem Shipbuilding Corporation, Ltd., Boston, Mass., to determine definitely the effectiveness of the Dunn agitator. In these tests, samples of paint were first taken from their containers and thoroughly mixed. Samples were then taken intermittently from the Dunn nozzle and from the brush drips. These samples were analyzed by the United States Bureau of Standards at Washington and disclosed the fact that while the brush drips showed 18 percent variation there was but one-tenth of one percent difference between the atomized paint and that taken from the container after mixing and before painting.

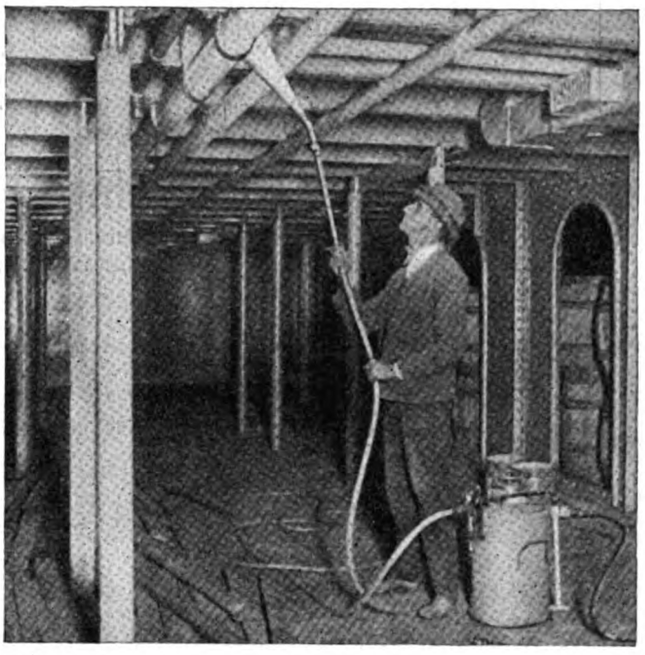


Fig. 2.—Painting hold of S. S. Mexico

Sextuple Expansion Engines

IN the course of a very interesting discussion which followed the reading of a paper by Mr. G. R. Hutchinson on "Reciprocating Engined Steamers" before the Institute of Marine Engineers, Mr. W. Hamilton Martin gave some particulars of a sextuple-expansion engine which was designed and built by his father in 1893 and which is still in service on a fast river vessel. The engine, which develops 400 horsepower, has its six cylinders arranged in pairs by means of a yoked connecting rod acting on a single crank, thus giving three cranks, the engine being shorter and appreciably smaller as well as lighter than a triple-expansion engine of the same power. In order to employ to the fullest advantage the large total ratio of expansion which is available, superheated steam is supplied at an initial pressure of 250 pounds per square inch. The valuable data obtained from this engine led to further theoretical investigations, and proposals were put forward for a six-stage expansion engine having a greater total range of expansion, but to obtain a reasonable terminal pressure it was found that an initial pressure of 550 pounds per square inch would be required. At that time such a pressure was regarded as being impossible of attainment, but, since today such a pressure is actually being used on board ship, Mr. Hamilton Martin suggests that many of the results which it was proved could be obtained theoretically with sextuple expansion are now capable of being achieved. He further suggests that such an engine would prove

Generated on 2024-09-12 14:20 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

superior to the arrangement of high pressure reciprocator in conjunction with the low pressure turbine—if not, perhaps, as regards fuel consumption, at least as regards initial cost and the ease of maintenance and operation.— *Shipbuilding and Shipping Record.*

A Small Diesel Centrifuge

THE Sharples Specialty Company, Philadelphia, Pa., has developed a new type of centrifuge for purifying fuel and lubricating oil for small Diesel engines.

Compactness and simplicity are the special features of this design. The bowl has but three parts—the shell, top and a three-wing element. The bowl is 4¼ inches in diameter, 3 inches long, weighs 4 pounds and has a dirt-holding capacity of 26 cubic inches or 1½ pounds. The machine complete, with a 1/5-horsepower motor-drive, weighs 66 pounds. The extreme dimensions are height 17¾ inches and width, with hinged cover lifted for cleaning, 14⅜ inches.

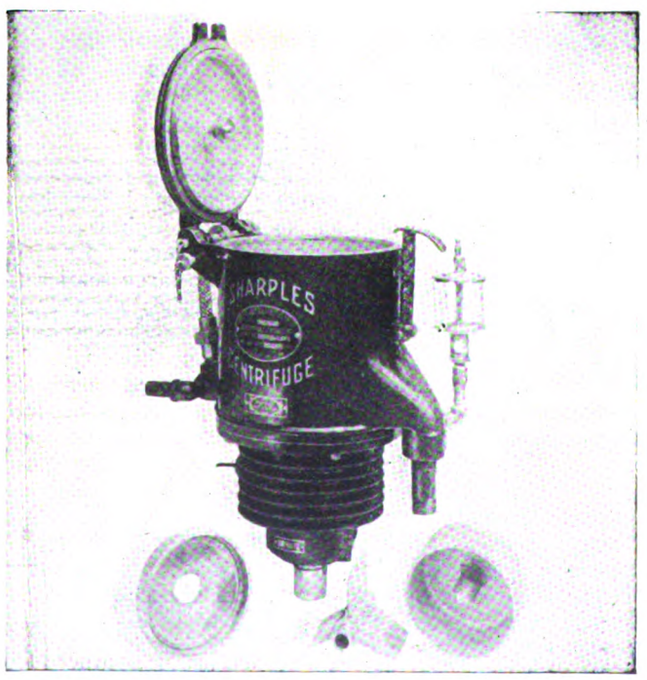
The fuel oil capacity is rated as 15 to 25 gallons per hour and for lubricating oil 15 to 20 gallons per hour.

Arrangement is made for mounting the centrifuge either on a bulkhead or on the engine frame. Motors are supplied to use 32, 115 and 230-volt direct current and 110 and 220-volt 60 cycle alternating current.

A gasket joint under the bowl cover makes it gas-tight which prevents the escape of oil vapors. The dirty-oil supply and clean-oil delivery pipes may be permanently connected, since their removal is not necessary when cleaning the bowl.

The motor is mounted directly under the bowl. Its housing has cooling veins intended to carry off heat generated in operation. Leads are conveniently arranged for connection to the supply of current.

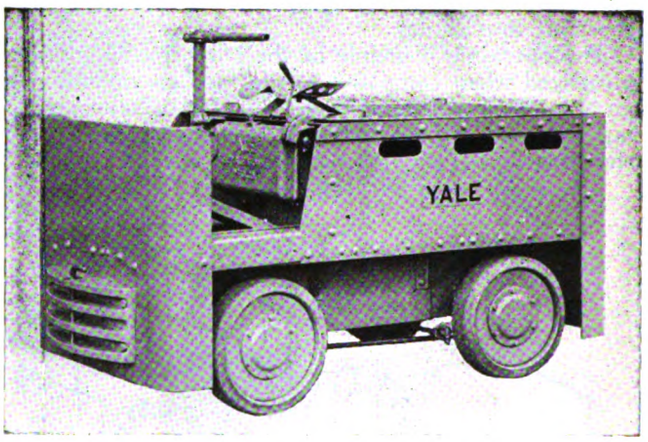
This machine promises to meet an increasing demand for a high grade, small, light centrifuge suitable for use in Diesel engine plants of small power. It should be noted that its capacity is comparable to that of older type centrifuges of considerably larger dimensions and weight.



A Compact centrifuge for use with small Diesel engines

Yale Heavy-Duty Tractor

THE Yale & Towne Manufacturing Company, Stamford, Conn., has introduced a new Yale electrically-driven tractor capable of an ultimate draw-bar pull in excess of 4,000 pounds, depending upon road surface conditions, and which will operate a continuous draw-bar pull of 1,000 pounds without danger of overheating. By driving all four wheels of the



Yale four-wheel drive heavy-duty tractor

machine, it is possible to get the maximum of traction with the given overall weight of machine.

The four-wheel brakes on this machine operate through the differentials so that they properly equalize regardless of the conditions of the lining.

Steering is accomplished through a lever handle so arranged that the handle may be folded up out of the way if the driver wishes to leave his seat. The construction of this folding linkage is very rugged so that no wear will develop in this folding mechanism, through continued use.

The driving units consist of two standardized units connected in parallel at the controller. The increased power obtained by two units instead of one unit gives a capacity somewhat in excess of heavy duty tractors now available. This machine is regularly furnished with a 48-voit motor, and a 23 to 1 gear ratio.

The Atlantic Works Sold

THE sale of The Atlantic Works, East Boston, Mass., last month to the Bethlehem Shipbuilding Corporation, Ltd., occurred on the seventy-fifth anniversary of the company. In 1922 an arrangement was made with the Bertelsen & Petersen Engineering Company, also of East Boston, whereby the activities of both companies were concentrated at the plant of The Atlantic Works. At this time the facilities of the company were greatly expanded and improved. A large steel floating dry dock was installed in addition to the small floating dry dock and three railway dry docks which were already in operation. These improvements gave the Port of Boston, for the first time, adequate ship repair facilities. The company's plant has been the largest ship repair yard in the Port of Boston. Hereafter the plant will be operated by the Bethlehem Shipbuilding Corporation, Ltd., in conjunction with their Simpson Plant, also located in East Boston.

Generated on 2024-09-12 14:20 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

Questions and Answers for Engineers

Practical information on the operation and maintenance of boilers, engines and auxiliaries

This department is maintained to help those who desire practical information regarding engine room problems or who are preparing to take examinations for a marine engineer's license. Readers are urged to send in questions. Inquiries bearing the name and address of the writer will be answered promptly by mail. If the question is of general interest the answer will also be published in an early issue of the magazine, although the identity of the writer will not be disclosed in doing so. Anonymous communications will not be considered.

Burning Boiler Fuel Oil in Diesel Engines

Q.—What engine adjustments would be required to burn boiler fuel oil in a Diesel engine?

A.—Compression must be raised, the temperature of the jacket water increased, spray valve timing advanced and the engine must be warmed up on light oil before operation on the heavy oil is started.

Uses of the Indicator

Q.—Aside from power measurement, what are the other important uses of the indicator in connection with the operation of Diesel engines?

A.—For measuring compression and determining the effect of changes in adjustment of valves, air pressure, fuel pump, etc., on engine performance, or detecting the occurrence of such changes when they are not intentionally made.

Galvanic Action in a Condenser

Q.—What generally causes galvanic action in a surface condenser?

A.—One of the several impurities found in water is sulphuric acid. This acid, in coming in contact with the copper in the condenser tubes and the iron of the condenser casing, feed pipes and boilers, constitutes a galvanic battery, which sets up a galvanic current, causing rapid corrosion.

Boiler Zincs

Q.—Please give me some information regarding the use of boiler zincs. How are they made and how are they fitted?

A.—As a means of neutralizing corrosive tendencies in boilers, zinc plates are suspended in the boiler water. The zinc plates, metallically connected to the boiler, are usually suspended on brackets and separated by ferrules so that the water may have free access to the entire surface, with baskets so arranged as to catch pieces of zinc oxide which scale off. Rolled zinc should be used about ½-inch thick and of convenient size for handling and to avoid waste in cutting. The zinc plates should be located near the incoming feed to neutralize the effect of air and in such other places as are specially subject to pitting. It is customary to allow ¾ square foot of zinc for each 100 square feet of heating surface.

Diesel Fuel Oil

Q.—What is the nature of the fuel generally used in Diesel engines?

A.—It is a distillate of crude petroleum secured by condensing the vapor that begins to come from the still, at about 700 degrees F., after the gasoline and kerosene have been removed. It ranges in gravity from 33 to 22 degrees Baumé.

Care in Handling an Indicator

Q.—What care should be taken in handling an indicator?

A.—It should never be left attached to the cylinder when not in use. Clean thoroughly and oil lightly immediately after using. Never hold the indicator by the pencil arm or parallel motion and never use emery cloth to clean the piston.

Can Boiler Fuel Oil Be Used in Diesel Engines?

Q.—Can ordinary boiler fuel oil be used as Diesel fuel?

A.—Yes, if it is properly conditioned and handled. It must be heated to reduce its viscosity enough to permit pumping and atomizing it. It must be passed through a centrifuge for removing water and dirt and must not be allowed to strike the cold walls of the cylinders before combustion is complete.

Important Considerations in Adjusting Valve Gear

Q.—What would you consider to be points of utmost importance for an engineer to know before trying to make adjustments of any kind to the valve gear of an engine?

A.—It is very important to know the purpose of each part and the effect that will be produced by any change in its adjustment. If, after a careful study of the gear, there is any doubt as to the purpose of any part, or if the means for making adjustments that appear to be needed cannot be discovered, it is best to send to the makers for instructions, stating clearly the size and type of the engine and, when possible, giving the number and the date on which it was built and installed.

Steam Space in Scotch Boilers

Q.—How is the steam space in Scotch boilers determined?

A.—The amount of steam space required in Scotch boilers varies somewhat with conditions but the following formulae will give locations for the upper row of tubes, which if adhered to, will assure sufficient steam space:

Distance in inches from centerline of boiler to centerline of upper row of tubes (for boilers with common combustion chambers) 0.2 × diameter of boiler; (for boilers with separate combustion chambers) 0.166 × diameter of boiler. For tugs and coastwise vessels which are not subject to quite as much heavy weather as ocean-going vessels, the steam space may be somewhat smaller.

Generated on 2024-09-12 14:17 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

Material for Corrugated Furnace

Q.—What material is used for the corrugated furnaces for Scotch boilers?

A.—The rules governing the construction of marine boilers in the United States require that the tensile strength of steel used in the construction of corrugated furnaces shall not exceed 67,000 and be not less than 54,000 pounds per square inch. The minimum elongation in 8 inches shall be 20 percent.

Packing for Flanged Union in Oil Line

Q.—What packing should be used in a flanged union in an oil line?

A.—For low pressure oil pipe union flanges, having 1/64-inch raised facings, special fiber, compressed asbestos sheet, chart paper and shellac or soft aluminum sheet may be used between the facings.

For high pressure oil pipe union flanges, having 1/64 inch raised facings, metal to metal, ground joints or, in difficult locations, soft annealed aluminum sheet may be used between the facings.

Effective Pressure on Piston

Q.—What is the net or effective pressure on the piston of a steam engine?

A.—It is the difference between the total pressure of the steam on one side, and the total pressure of the resisting force on the other side of the piston. For instance; if the resisting force is the atmospheric pressure, which is 14.7 pounds per square inch, and area of the piston is 90 square inches, and the absolute steam pressure is 80 pounds per square inch, the net pressure on the piston is (80—14.7) x 90 = 5,877 pounds.

Starting Diesel Engines

Q.—What method is generally adopted for starting practically all Diesel engines?

A.—The method for starting adopted on practically all Diesel engines embodies the use of high pressure air, which, by entering one or more cylinders, forces the piston downward. The air is discharged at the end of the stroke and at the proper time (that is, the point of fuel injection) another air charge is introduced through a mechanically operated air-starting valve. This procedure is continued until the other cylinders start firing, whereupon the air supply is shut off.

Beading and Flaring

Q.—Are the ends of tubes in marine boilers beaded over or flared?

A.—In marine boilers of the firetube type, in which the tube ends project into the space occupied by the hot gases, they must be beaded over into close contact with the tube sheet. This not only protects the metal of the tube end from overheating but also increases the resistance of the tube to pulling through the tube sheet. Beading is not necessary in watertube boilers as the ends of the tubes are protected by water and there is no danger of their becoming overheated. It is not uncommon in watertube boilers, however, to flare the end of the tube slightly, by means of a tapered mandrel driven into the tube. This is done as a matter of protection against the tube pulling through the tube seat in case of overheating due to low water. The diameter of the extreme end of the tube is usually increased about ⅛ inch in the flaring process.

Propeller Vibration

Q.—In a single screw ship of fine after body fitted with 3-bladed propeller of large blade area, objectionable vibration has been experienced. Will a new propeller design eliminate this difficulty?

A.—It is impracticable to state definitely what steps are required to meet the conditions to which you refer. It is assumed from the wording of your question that the difficulty lies with the propeller or that part of the ship immediately adjacent.

It will help in clarifying this problem to consider the action of the water in its approach to and entry into the propeller disk. The flow of water to a blade in the horizontal position is practically normal. As the blade approaches closer to the upper position, a reduced flow takes place because the surface of the ship's after body tends to follow the direction of rotation. The supply of water is the minimum when the blade is about to pass the stern post. At this point the torque is also a minimum. When the blade has passed the stern post, the run of water to it is against the direction of rotation and the torque will then approach a maximum. If the after body lines are full, the fluctuations thus caused will be relatively pronounced. As the blade continues its motion, the water closing in along the sides of the ship and the wake acting on the back side of the blade causes the torque to reach a maximum. This cycle recurs as many times during a revolution as there are blades to the propeller.

If a ship has a very heavy deadweight and the propeller works close behind a broad stern post, very severe vibrations are to be expected.

It is generally recognized that the most direct remedy for these difficulties is to move the propeller as far aft from the sternpost as is practicable, thus minimizing the influence of the after body on the lines of flow of the propeller.

Herald Anderson, in the January number of MARINE ENGINEERING AND SHIPPING AGE, 1923, suggests that the cutting away of the leading edge of the propeller in a gradual curve aft will permit the blade to encounter the changes in direction of flow and in volume of feed above described more gradually than would be the case were the leading edge straight. This will obviously tend to reduce vibration. In adopting this solution it will be necessary to accept a minor loss in efficiency as compared with a blade of more normal type, but this loss will not be great and may be more than justified by the results secured.

In the case of a large auxiliary yacht coming within the writer's own experience, both three- and four-bladed propellers had been used with satisfaction. The vessel was originally designed for the use of a two-bladed feathering screw. When this screw was installed, a pronounced shock, readily recognizable throughout the ship, took place every time the blades passed the vertical position. In connection with alterations to the power plant, which contemplated a considerable increase in propeller revolutions, it was possible to cut away both leading and flowing edges of the propeller blades to a very considerable degree without reducing the efficiency of the screw. Experience in service subsequent to this change indicated an entire absence of the shock which was referred to above.

LAUNCHING.—The 13,000-ton Diesel tanker *Sun*, to be operated by the Sun Oil Company, was launched on July 14 by the Sun Shipbuilding & Dry Dock Company, Chester, Pa. The vessel is 480 feet long, 65 feet beam, and 37 feet molded depth, propelled by two 2,800 horsepower Sun-Doxford engines.

Generated on 2024-09-12 14:19 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

Questions and Answers Relating to Ship Design and Construction

By J. L. Bates, Naval Architect, and W. B. Newton, Marine Engineer

This department is maintained for the purpose of answering all questions relating to ships and their machinery. All inquiries should bear the name and address of the writer. Anonymous communications will not be considered. The identity of the writer, however, will not be disclosed unless the editor is given permission to do so.

Displacement of Appendages

Q.—For purposes of approximation, can you furnish information as to the displacement of appendages on several types of ship, such as oil tankers and cargo vessels?

A.—The following data, which are the results of careful calculations made on the four types of vessels shown, should serve your purpose:

	Tug	Cargo Vessel	Transport	Oil Tanker
Displacement in tons	1,000	8,500	10,000	16,500
Number of propellers ...	1	2	2	1
Type of bilge keel	Plate	Plate	Plate	Plate
	Displacement in Tons			
Propellers	0.57	2.10	2.00	1.49
Shafting	....	1.26	3.77	....
Struts	....	1.83	2.57	....
Swells	0.28	6.28	2.86	....
Bilge keels	....	1.09	1.20	0.82
Rudder	0.30	1.97	2.00	0.92
Shell plating	5.12	76.10	69.70	100.00
Total displacement of appendages	6.27	90.63	84.10	103.23

Ship's Propelling Force

Q.—How is a ship's propelling force determined?

A.—By "propelling force" it is assumed that you mean the force in pounds which is required to overcome the ship's resistance in pounds R at a predetemined speed V. Let the power delivered by the screw in order to drive the ship at V knots be represented by P (the effective horsepower, including appendage effect). Then

$$P = \frac{1}{326} RV$$

and the propelling force, equivalent to the resistance, becomes

$$R = \frac{326\ P}{V}$$

The value $\frac{1}{326}$ is derived as follows:

Feet per knot = 6,080. Minutes per hour = 60. Foot-pounds per horsepower = 33,000.

Then to reduce power corresponding to a speed expressed in knots to resistance in pounds, multiply by

$$\frac{33{,}000 \times 60}{6{,}080} = 326$$

Balsa Wood Filling in Cruiser Rudders

Q.—How is balsa wood applied in filling the rudders on the new scout cruisers? What advantages has this over the old type rudders?

A.—The only reason for the use of this material in lieu of pine (which had been used before) is its very considerable saving in weight. Balsa wood is much more expensive but at the time the original change was made, in the *Omaha* class of cruisers, a considerable quantity of the material was available, presumably at a very low cost, as it had been accumulated during the war by the Shipping Board.

In installing this filling, it is first fitted in place and then removed while the interior surfaces of the rudder are covered with bitumastic solution. The balsa wood is then replaced and packed in with a mixture of tar and pitch in equal parts; after this, hot pitch and tar are poured in at the top. When the rudder is completely plated, the interstices are gunned with pitch and tar.

Thrust Delivered by Propeller

Q.—The angle of the blades times the number of revolutions of blades is equal to the force required, but how is the unit of force found?

A.—The above statement appears to omit certain factors of importance. It is assumed that in this case you are approaching the "propelling force" through the thrust delivered by the propeller. This may be done as follows:

Let T = thrust in pounds.
N = revolutions per second.
V = speed of advance in feet per second.
P = face pitch in feet.
D = propeller diameter in feet.
C_T = coefficient of performance, the value of which depends upon the individual propeller.

Then the thrust horsepower is found as follows:

$$\text{T.H.P.} = \frac{C_T \times R^3\ P^2\ D^2\ V}{550}$$

$$\text{But } C_T = \frac{T}{N^2\ P^2\ D^2}$$

$$\text{Then T.H.P.} = \frac{TR^2\ V}{N^2\ 550}$$

$$\text{Therefore } T = \frac{550\ N^2\ \text{T.H.P.}}{R^2\ V}$$

Qualifications for Officer's License

Q.—I have had two years' sea experience as a ship's carpenter, in addition to other experience such as a draftsman. What must I do to obtain the first certificate as an American ship's officer, and what pay does the lowest rank officer receive? I have had fairly good shipbuilding experience and education but have a family to support and am thirty-nine years of age. What is the scale of officers' salaries rising to captain and are the hours the same as on British ships?

A.—In order to be eligible for examination for third officer's license, the applicant must show discharges of actual sea service for a period covering three years—the first year as deckboy, ordinary seaman, or able seaman. At the end of the first year the applicant should be able to obtain an able seaman's certificate. The next two years must be spent as quartermaster. In your particular case you should be able to obtain an able seaman's certificate, if you can show two years' actual sea service, and to obtain a license you would have to serve two more years as quartermaster.

The following scale of wages for deck officers may

Generated on 2024-09-12 14:17 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

be taken as a fair average obtaining on the West coast and not for any particular steamship line:

Chief engineer, $175 to $180.
Second officer, $150.
Third officer, $135.
Fourth or junior officer, $125.

These wages will, of course, vary with the different sizes and classes of vessels.

Captain's wages are from $280 and up per month—all depending on the class of vessel.

The hours on and off duty are, in general, the same on British and American ships.

Communication

Powdered Coal As Fuel on River Boats

NEW ORLEANS, LA.

TO THE EDITOR:

The article published in your June issue by F. C. Moyer, on the "Use of Powdered Coal as fuel on River Boats," contains many statements not based on facts and which are not true. The writer equipped the S. S. *Illinois* of the Mississippi Warrior Service, Inland Waterways Corporation, with powdered fuel. This was the first vessel in the world successfully to burn powdered coal. I wish to correct several statements made by Mr. Moyer in his article.

Powdered coal is not heralded by its proponents to be a "cure for all steamship ills." The trade in which a vessel is employed, and the fuel price, be it either coal or oil, prevailing at these points, together with other engineering considerations, are the factors which govern the adoption of any particular kind of fuel on a steamship.

Mr. Moyer seems to be of the idea that powdered coal is satisfactory everywhere, except in river towboat work. This is not the case. It is true that some experimenting was imperative aboard the *Illinois*, due to the fact that this was the first vessel in the world successfully to burn powdered coal. Mr. Moyer speaks of the vessel not being able to maneuver. We all know that one of the features of the powdered coal installation is its flexibility. The writer has been aboard the *Illinois* after the installation was perfected, and knows of no difficulty in maneuvering.

The *Illinois* is now running between Memphis and St. Louis, where coaling facilities are available to coal this boat. This is a trade in which only a light draft vessel can be employed. Mr. Moyer gives no authentic source of his information, except to state that it comes from a reliable source. We do not know what reliable source furnished the information, but oil is not used aboard the vessel at any time except for starting purposes. It can be stated, however, that results aboard the *Illinois* are very encouraging, particularly taking into consideration the fact that the price of fuel oil has dropped considerably and the *Illinois* has had to compete with low price fuel oil, as compared with the price of coal, which remains stationary. How long the price of fuel oil will stay at its low price level is a very difficult matter to state, but the powdered coal, along the Mississippi River with its high efficiencies, has come to stay.

It would be a poor naval architect, who could not design his boat to have light draft to keep it operating satisfactorily, not only on the lower Mississippi River, but on the upper Mississippi River and its tributaries as well.

WARREN C. GRAHAM.

Personal

H. E. Frick, vice-president of the **Export Steamship Corporation,** 25 Broadway, N. Y., has been given the additional title of general manager of the organization.

Captain Samuel O. Larche, of New Orleans, has been appointed United States local inspector of hulls, to succeed the late **Captain Arthur V. Hulme,** who died recently. Captain Larche, who is 43 years of age, was born in Abbeline, Texas, and reared in Florida. From the age of 17 he followed the sea until 1916, when he entered the **United States Steamboat Inspection Service** where he has served as local inspector of hulls at Galveston and Tampa.

Charles F. Bailey, engineering director, **Newport News Shipbuilding & Dry Dock Company,** Newport News, Va., was recently awarded the honorary degree of Doctor of Engineering at the 58th annual commencement of the **Worcester Polytechnic Institute** from which he graduated 40 years ago. The citation of the award was given by **Rear Admiral Ralph Earle,** U. S. N. (retired), president of the Institute, who summed up Mr. Bailey's achievements as follows: "Charles Franklin Bailey, graduate in 1888, mechanical engineer, naval expert, designer and builder of ships, moving genius of a great shipbuilding and dry dock company, organizer of the human element in this great company, engineer of personnel, consulting engineer of a famous electrical corporation, interested and active in matters educational, civic, human, a loyal son and trustee of his alma mater."

Charles F. Bailey

Asa F. Davison, vice-president in charge of operations of the **Black Diamond Steamship Corporation,** New York, operators of the **American Diamond Line** for the **Shipping Board,** has resigned from that position effective August 1. He will remain with the organization in an advisory capacity.

Michael J. Hanlon, former port engineer of the **United States Lines,** has been appointed operating manager of the **Black Diamond Steamship Corporation** to fill the vacancy left by **J. F. Paige,** who resigned recently.

Generated on 2024-09-12 14:14 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

J. P. Meyer, Emil Lederer and **C. J. Beck** have been appointed by **Dr. Wilhelm Cuno,** chairman of the board of the **Hamburg-American Line,** New York, to constitute an executive board of directors to conduct the management of this line in the United States and Canada. These three individuals have represented the Hamburg-American Line in this country for many years past.

Julius P. Meyer's first connection with the line dates back to 1888 when he entered the employ of **Kunhardt & Company,** general agents at that time for the line and of which firm his father was a member for many years. In 1889, when the company opened its own offices in New York, Mr. Meyer entered the service directly. After various promotions he became assistant to the general manager and in 1912 was appointed a member of the New York board of directors in charge of the company's management in the United States. When in 1920 the Hamburg-American Line resumed operations under an agreement for a joint service with the **Harriman** group of shipping interests, Mr. Meyer acted as American representative for the line. In 1926, under a new agreement with the Harriman group, when the entire operating organization of the **United American Lines, Inc.** was taken over by the Hamburg-American Line, Mr. Meyer was appointed resident director and general representative.

Julius P. Meyer

Emil Lederer

C. J. Beck

C. J. Beck, a second member of the newly formed executive board of directors of the line, began his affiliation with the company when he entered the employ of the **Atlantic Transport Company,** freight agents for the Hamburg-American Line in Chicago in 1893. In 1906 he joined the staff of the line in New York as assistant to the manager of the freight department. In 1909 he was placed in charge of the line's Atlas service. From 1912 to 1918 Mr. Beck served as freight traffic manager of all United States and Canadian services. At the latter date, due to the destruction of the Hamburg-American Line's business, he resigned to accept the position of general manager of the **Kerr Steamship Company,** New York. He joined the United American Lines, Inc., as vice-president in charge of freight traffic in 1920, continuing in this capacity until his recent appointment as a member of the executive board of directors in charge of the freight traffic and operating departments.

Emil Lederer, a member of the executive board of the line in charge of passenger traffic, was traveling passenger agent and later manager of the cabin department of the **Holland-America Line** prior to his affiliation with the Hamburg-American Line in 1895. In that year, he joined the New York office of the line as manager of the third class department and in December, 1912, was appointed passenger traffic manager. In 1920, when the agreement was made with the Harriman shipping interests to operate a joint service, he was made director of passenger traffic. In 1923 he was appointed vice-president of the United American Lines, Inc., in which capacity he served until his recent appointment.

Carl E. Petersen, naval architect-consultant to the **Newport News Shipbuilding & Dry Dock Company** in the preparation of plans and specifications for the rebuilding of the steamers *Mount Vernon* and *Monticello,* has been appointed by President C. A. McAllister to the committee of naval architecture of the **American Bureau of Shipping.**

Captain Harry E. Yarnell, U.S.N., commander of the aircraft carrier U. S. S. *Saratoga.* has been appointed to succeed **Rear Admiral John Halligan** as chief of the Navy Department's **Bureau of Engineering.** Captain Yarnell was born in Independence, Iowa, in 1875. He was appointed to the Naval Academy from Iowa in 1893. In 1916 he commanded the U. S. S. *Nashville* and in 1917 was aide on the staff of the commander of the naval forces in European waters. He was awarded the Navy Cross for this duty. In 1919 he was a member of the Joint Board Planning Committee in Washington, and in 1921 served as chief of staff, destroyer forces, Atlantic fleet. In 1922 he commanded the Naval Air Station, Hampton Roads, Va. Two years later he was commanding officer of the aircraft squadron, scouting fleet. Captain Yarnell is a graduate of the Naval War College, and in 1926-1927 he served on the staff of the college. He is a qualified naval aviation observer.

Captain H. E. Yarnell

Generated on 2024-09-12 14:20 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

William H. Todd was re-elected president of the **Todd Shipyards Corporation,** New York, at a recent annual meeting of the stockholders. The following officers were also re-elected: **Arthur E. Goddard,** vice-president; **Sanford S. Cox,** secretary and treasurer, and **E. P. Enfer,** assistant secretary and treasurer. **William H. Todd** and **John D. Reilly,** whose terms of office as directors expired, were re-elected for a further period of four years.

W. H. Gerhauser has been elected president of the **American Ship Building Company** of Cleveland, Ohio, to succeed the late **Alfred G. Smith,** who died recently. Mr. Gerhauser was born in Detroit, Mich., and was educated at the Detroit University School and the College of Engineering, University of Michigan. He held the position of assistant secretary of the **Detroit Board of Commerce** from 1911 to 1913. He was assistant superintendent and superintendent of the **Williams Bros. Company** until 1916 when he became president of **W. H. Gerhauser & Company.** In 1917 he came to Cleveland as assistant to the president of the **American Ship Building Company,** which position he held until his promotion to vice-president of that organization in 1918. Other officers elected at this time included: **G. W. Cottrell,** general counsel of the company, who was made vice-president, and **R. B. Ackerman,** auditor, who was made acting secretary.

W. H. Gerhauser

John Farrell Metten, president of the **Marine Engineering Corporation,** Philadelphia, Pa., was awarded the honorary degree of Doctor of Engineering on June 12 at the commencement exercises of Lehigh University because of his particular prominence in naval engineering. He entered the field of naval architecture as a young man and, foregoing a college education, began a career of design, development, invention and achievement. He was employed as a draftsman by the **Newport News Shipbuilding & Dry Dock Company,** Newport News, Va., from 1894 to 1900, and later became chief draftsman, chief engineer and vice-president of the **William Cramp & Sons' Ship & Engine Building Company.** Mr. Metten's success in the application of direct turbine drive for the propulsion of the fastest passenger ships built in America, and his achievements in the application of turbine reduction gear drives to the outstanding merchant vessels, destroyers and scout cruisers built in this country, won for him the distinction of being charged with the adaptation of the Burmeister & Wain Diesel engine to American requirements. In 1927, when six scout cruisers were to be constructed by three American shipbuilding companies, Mr. Metten was drafted by the Navy and by the three companies to become president of the **Marine Engineering Corporation,** an organization charged with the design of these cruisers. Mr. Metten is a member of the American Society of Naval Engineers, the Society of Naval Architects and Marine Engineers, the American Society of Mechanical Engineers and the American Association for the Advancement of Science.

J. F. Metten

E. L. Stewart, naval architect of the **Standard Oil Company of New Jersey,** has been appointed chairman of the technical committee on hull details of the **American Marine Standards Committee. Amos S. Hebble, Jr.,** of the **Tietjen & Lang Dry Dock Company,** has been added to this committee and **Lieutenant Commander Claude O. Kell, C. C., U. S. N.,** has succeeded **Lieutenant Commander E. L. Cochrane, C. C., U. S. N.,** in this committee.

R. R. Adams has been appointed by the **United States Shipping Board** to be technical assistant to **Commissioner Cone** in connection with his duties as commissioner in charge of construction loan matters. Mr. Adams has had long experience in the shipping business and comes to the Shipping Board from the firm of **J. H. Winchester & Company,** New York, who are managing operators for the **American Merchant Lines.**

W. W. Smith, chief engineer of the **Federal Shipbuilding & Dry Dock Company,** Kearny, N. J., has been appointed chairman of the technical committee on engineering details of the **American Marine Standards Committee.** The following members have been added to the committee: **J. Lewis Luckenbach,** vice-president, **American Bureau of Shipping; Walter I. Green,** superintendent engineer, **Luckenbach Steamship Company; C. E. Klitgaard,** superintendent, construction and repair division, marine department, **Standard Oil Company of New Jersey;** and **John F. Nichols,** chief engineer, **Newport News Shipbuilding & Dry Dock Company. Captain O. L. Cox, U. S. N.,** has succeeded **Captain S. M. Robinson, U. S. N.,** in this committee.

Obituary

Sir John I. Thornycroft, founder of **John I. Thornycroft & Company, Ltd.,** Southampton, England, died at his home on the Isle of Wight on June 28, aged 86. Sir John was educated at Glasgow University. In 1866 he established on the Thames at Chiswick the shipyard which for 25 years was devoted to the development of high-speed launches and torpedo boats. In 1906 the shipyard was moved to Woolston near Southampton where the construction of high-speed vessels continued on a larger scale. Among the developments in which Sir John was a pioneer, were the application of watertube boilers to high-speed vessels, the design of tunnel-stern, shallow draft vessels and the single-step hydroplane. Sir John was a vice-president of the Institution of Naval Architects in 1889 and an honorary vice-president in 1909.

Generated on 2024-09-12 14:20 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

Ship Construction and Repair News

Proposed work—Bids asked—Bids received—Contracts awarded—Current activities

Export Line to Issue Plans for Four Steamers

ACCORDING to information received from H. E. Frick, vice president of the Export Steamship Corporation, 25 Broadway, N. Y., plans and specifications for the construction of four 9,500-ton combination passenger and cargo steamships will be issued to shipyards for bids early this month.

The new ships, which were designed by George G. Sharp, naval architect, 30 Church street, N. Y., are of the single-screw, shelter-deck type, 450 feet long between perpendiculars, 59 feet molded beam and 46 feet 6 inches molded depth to the shelter deck. They will have a deadweight tonnage of 9,500 on a draft of 27 feet 10½ inches.

The holds will have sufficient space for 4,500 tons of cargo and there will be space for 500 tons of refrigerated cargo. The accommodations for 100 passengers will include ample public rooms.

Steam will be supplied at 325 pounds per square inch working pressure and 150 degrees superheat by four oil-fired water-tube boilers. Propulsion will be by a single screw driven by turbines, through single reduction gearing.

The vessels are to be operated between North Atlantic ports of the United States and ports in the Mediterranean.

Plans for Erie R. R. Floating Equipment Issued

PLANS and specifications for the construction of five lighters, one car-float and one steam hoist for the Erie Railroad, 50 Church street, New York, were issued July 14. This project is in conjunction with its $27,000,000 improvement plan that was announced some time ago. Contrary to the original plan, however, the harbor tug will not be built, but it is expected that a tug already in service will be purchased.

The derrick lighter will have a length over bumper logs, 90 feet; length on the bottom, 72 feet; beam outside of planking, 30 feet; breadth at bottom, 30 feet, and depth at side at amidship, 9 feet.

Di Giorgio Fruit Co. Asks Bids for Constructing Two Vessels

INFORMATION has been received at this office that plans and specifications for the construction of one and two ships, respectively, for the Di Giorgio Fruit Company, 25 Broadway, N. Y., have been completed and that bids are now being asked from various shipyards along the coast. The vessels are for operation between the United States and West Indies ports.

Newport News Shipyard Awarded New I.M.M. Contract

THE International Mercantile Marine Company, 1 Broadway, N. Y., has placed an order with the Newport News Shipbuilding & Drydock Company, Newport News, Va., for the construction of a third liner in its building program of three sister ships for operation by the American Line Steamship Corporation, a subsidiary of the International Mercantile Marine, in the Panama-Pacific Line service. This ship will be slightly larger than the *California*, delivered by the Newport News yard at the end of last year, and virtually will be a sister ship of the *Virginia*, still under construction.

No name has yet been chosen for the new craft, but it is probable that it will bear the name of some state in the Union, like its sister ships.

The new liner will be 612 feet long, with a beam of 82 feet and a displacement of 35,000 tons. Its propulsion will be turbo-electric, the machinery for which is being manufactured by the General Electric Company, Schenectady, N. Y. The boilers, superheaters and oil burners will be supplied by the Babcock & Wilcox Company, New York. She will carry both passengers and freight, the passenger capacity being 800 and the freight-carrying capabilities in excess of 10,000 tons. Special attention will be paid to an intermediate refrigerating system which will allow the transporting of fruits and perishable products from California and Central American countries to the Eastern Seaboard.

Grace Line Asks for Construction Estimates

INFORMATION has been received at this office that the Grace Line, Inc., 10 Hanover Square, N. Y. C., is asking for estimates on the cost of construction of two 16-knot Diesel passenger and freight ships. The new ships are expected to be about the size of the *Santa Maria*, which is 486 feet overall, beam 64 feet and has a gross tonnage of slightly over 9,000. Further details will be available at a later date.

Construction of Hydraulic Suction Dredge Considered

IT has been learned that Frederic Snare & Company, contracting engineers of 114 Liberty street, N. Y., contemplate the construction of one hydraulic suction dredge for use on a project of the company in Peru. While definite details are not as yet available, the problem of constructing the special dredge for this service is being investigated from its many angles.

Berwind-White Collier Contract Awarded to Bethlehem Shipbuilding Co.

THE contract for two colliers for the Berwind-White Coal Mine Company, 1 Broadway, N. Y., has been awarded to the Fore River plant of the Bethlehem Shipbuilding Corporation, Ltd., Quincy, Mass., at a price of about $1,750,000. These vessels have a length overall 366 feet 6 inches; length between perpendiculars 350 feet; beam 50 feet; draft 23 feet 6 inches; depth 30 feet 3 inches; maximum displacement of 10,020 tons at 25 feet 3 inches draft. They are designed to travel at a speed of 10½ knots and will be driven by a single screw propeller.

One vessel will be equipped with two Scotch boilers and a reciprocating engine manufactured by Hooven, Owens, Rentschler Company, Hamilton, Ohio, which will develop 2,200 shaft horsepower. The other ship will be equipped with two watertube boilers and Bethlehem-Curtis turbines, developing 1,700 shaft horsepower. Both vessels will be equipped to burn pulverized coal as fuel and will each carry 7,000 tons of coal as cargo. Plans and specifications for the work were prepared by Theodore E. Ferris, naval architect, 30 Church street, N. Y., who will also supervize the construction.

Norfolk Ferry Contract Awarded To Spear Engineers

A CONTRACT for the construction of one new steel Diesel-electric ferryboat for the Norfolk County Ferries, Portsmouth, Va., has been awarded to the Spear Engineers, Inc., Norfolk, Va., at a price of $234,000 bids for which were received on April 25.

The new vessel is to have a length overall 173 feet; length between perpendiculars 146 feet; beam overall 57 feet; beam of hull at deck 37 feet; depth, molded 14 feet; draft 8 feet 6 inches. Plans and specifications for the work were prepared by Eads Johnson, 115 Broadway, N. Y.

Columbian S. S. Co. Contemplates New Construction

INFORMATION has been received that the Colombian Steamship Company, Inc., 17 Battery place, N. Y., contemplates the construction of new tonnage to replace some of its older vessels. The question of whether the new ships will be built in this country or abroad is dependent upon the award of mail contracts in the near future. Definite plans of the new construction will be given out after such awards are made.

Generated on 2024-09-12 15:01 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

Award of New York City Ferry Contract Pending Appropriations

THE award of a contract for the construction of one double-ended steel, steam ferryboat for the Department of Plant and Structures of the city of New York is being held up pending the meeting of the Board of Estimate early this month to consider an additional appropriation necessary to meet the bids that were received on June 29. An appropriation of $260,000 was previously made to cover construction of the new ferryboat, but, inasmuch as the lowest bid received, from the Todd Shipyards Corporation, New York was $353,241, an additional appropriation will be necessary before the contract is awarded.

The new ferryboat is to have a length over guards 151 feet; length outside end posts 148 feet; beam over guards, 53 feet, beam, molded, 37 feet 6 inches, depth to top of beams at side of guard 14 feet 3 inches; draft 8 feet 3 inches, and displacement 610 tons. Steam is to be supplied at 225 pounds per square inch from 2 watertube boilers equipped with oil burners. Propulsion is to be by single solid four bladed propellers at each end of the vessel, about 82 inches in diameter, driven at 160-revolutions per minute by two vertical, direct-acting, fore and aft compound engines coupled together.

Contract for Construction of Distribution-Box Boat Awarded

A CONTRACT for the construction of a 64-foot army vessel to be known as distribution-box boat L63 and class, has been awarded to the Harbor Boat Building Company of Terminal Island, Los Angeles, Calif., by the United States Army, Washington, D. C., at a price of $32,500.

The vessel is to have a length overall 64 feet; length on L. W. L. (6 feet 6 inches above base) 59 feet; beam, molded, 16 feet; beam over guards 17 feet 4 inches; depth, molded, 6 feet 6 inches; draft, loaded, 6 feet, and speed 10 knots. She is to be propelled by a direct-acting two or four-cycle, solid or air injection, marine Diesel engine of four or six cylinders, designed to afford about 120 shaft horsepower at normal propelled revolutions. Bids for the work were received in the office of Major General B. F. Cheatham, on June 18, and other tenders received were as follows:

Name	Price	Days
Crowinshield Shipbuilding Company	$34,564	135
George W. Kness Company	35,611	180
Brewer Drydock Company	35,956	110
Norfolk Navy Yard	37,285	(without engine or equipment)
Ira S. Bushey & Sons, Inc.	44,000	
Bremerton Navy Yard	45,000	5 (months)
Jakobson & Peterson, Inc.	46,000	
Spear Engineers, Inc.	46,812	
Southern Shipyard Corporation	46,443	
Kingston Drydock & Construction Company	49,991	
Gibbs Gas Engine Works	69,583	

Derrick Barge Contract Awarded To Dravo Co.

THE Merritt-Chapman & Scott Corporation, 17 Battery Place, New York City, has awarded a contract for the construction of one derrick barge to the Dravo Contracting Company, Pittsburgh, Pa.

Plans for Conditioning Monticello and Mount Vernon Issued to Shipyards

PRELIMINARY plans and specifications for reconditioning the two former German liners *Monticello* and *Mount Vernon* were issued to various shipyards by Captain R. D. Gatewood, manager of the maintenance and repair division of the United States Shipping Board, on Thursday, July 12, complete plans and specifications being issued on Monday, July 16. The yards will be given six weeks in which to prepare estimates on the several methods proposed for reconditioning the vessels.

According to the plans prepared by Gibbs Brothers, 1 Broadway, N. Y., four alternatives will be made in addition to the original proposal, and according to the plans prepared by the Newport News Shipbuilding & Drydock Company, Newport News, Va., two alternative proposals will be considered.

The Shipping Board, however, does not propose to undertake the task of reconditioning the vessels. The tenders are to be solicited as a guide for prospective purchasers of the United States and American Merchant Lines in formulating their bids for these lines. At the same time the purchasers are to have the option of reconditioning the vessels on their own plans if they decide to substitute the two vessels for the liners the *President Roosevelt* and the *President Harding*.

New Bids to be Asked for Constructing New York State Ferryboats

ONLY one tender was received on July 6 at the office of Lewis M. Farrington, secretary of the Department of Mental Hygiene, Albany, New York, for the construction of two 115-foot Diesel-electric ferry boats designed by Eads Johnson, naval architect, 115 Broadway, New York. This bid was submitted by the Federal Shipbuilding Co., Kearny, N. J., in the amount of $157,500 for each boat. The proposal was rejected. It is understood that new tenders will be called August 1, 1928.

The date for the receipt of bids for furnishing machinery for the new boats, which was set for July 6, has been postponed to August 15.

Steel Carfloat to Be Built at Moore Drydock

THE Western Pacific Railroad Company, San Francisco, Calif., has awarded a contract to the Moore Drydock Company, Oakland, Calif., for the construction of one all-steel carfloat, at an approximate cost of $115,000 and a time of 140 days. Bids for the carfloat were received at San Francisco on May 31.

A contract for a second carfloat for the Santa Fe Railroad was also awarded last month to the Moore Drydock Company. This float will be similar to the one ordered by the Western Pacific and will have a length of 280 feet, equipped with four tracks to accommodate 24 cars.

Tenders for the carfloat were not opened publicly, but it is understood that the cost of construction will involve approximately $100,000.

Dollar Line Definitely Plans to Build Three Liners

R. STANLEY DOLLAR, vice president of the Dollar Steamship Line, San Francisco, Calif., was in New York recently, after conferring with Shipping Board commissioners and the postmaster general on new ocean mail contracts, announced definitely that his company is planning the construction of three 22-knot liners to be operated in the around-the-world service, specifications for which are now being prepared.

The length of the new ships will depend upon conditions in the regular ports of call, but it is expected that they will be about 600 feet long. They are to have accommodations for about 350 passengers each. The system of propulsion has not been decided upon, but will probably be either Diesel or turbine, depending upon initial costs and general availability for service on this particular route.

The whole situation is now being studied by the architects preparing the specifications and the conditions to be met will be laid before builders. The time for issuance of the specifications has not been fixed as yet, but it is indicated that bids may be asked in the fall.

Contract for Building Dredge Blackwater Awarded Dravo Co.

THE United States Engineer Office, Montgomery, Ala., has awarded a contract for the construction of a steel hull for the dredge *Blackwater* to the Dravo Contracting Company, Dravo building, Pittsburgh, Pa., at a price of $32,550. The hull is to be 150 feet by 38 feet by 6½ feet. Tenders for the work were received in Montgomery on May 25.

Rock Island Engineers Order Four Steel Barges

A CONTRACT for the construction of four 70 feet by 16 feet by 4 feet full deck small steel barges for the United States Engineer Office, Rock Island, Ill., has been awarded to the Dubuque Boat & Boiler Works, Dubuque, Iowa, at a price of $13,000. Bids for the work were received at Rock Island recently.

Toledo Shipbuilding Co. Awarded Contract for Two Dump Scows

THE Central Dredging Company, Chicago, Ill., has awarded a contract for the construction of two dump scows to the Toledo Shipbuilding Company, Inc., Toledo, O. Each scow is to be 144 feet long, 42 feet wide and 13 feet deep. The price involved was not made public.

Oil Barge Contract

THE Atlantic, Gulf & Pacific Oil Company, New York, recently awarded a contract for the construction of one oil barge to the Dravo Contracting Company, Pittsburgh, Pa. The price involved was not made public.

Generated on 2024-09-12 14:21 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

Construction and Repair Bids

Bids for Construction of S.S. Hydrographer Opened

BIDS were recently received and opened by the United States Coast & Geodetic Survey, 205 New Jersey avenue, S. E., Washington, D. C., for the construction of a steel, single-screw, Diesel-electric propelled survey ship, with the following results:

Name	Price	Days
Spear Engineers, Inc., Norfolk, Va.	$213,000	360
Charleston Drydock & Machine Company, Charleston, S. C.	273,000	15 months
Pusey & Jones Corporation, Wilmington, Del.	286 250	215
Manitowoc Shipbuilding Corporation, Manitowoc, Wis.	318,800	300
Sun Shipbuilding & Drydock Company, Chester, Pa.	336,800	220
Bethlehem Shipbuilding Corporation, Ltd., Bethlehem, Pa.	348,500	390
American Brown Boveri Electric Corporation, Camden, N. J.	366,300	300
Bath Iron Works Corporation, Bath, Maine	369,000	490
Federal Shipbuilding Company, Kearny, N. J.	374,125	290
New London Ship & Engine Company, Groton, Conn.	389,000	420

At the same time proposals were opened for furnishing the main propelling machinery and separate proposals for various auxiliaries, but these have not been analyzed as yet.

The survey ship is to be named the *Hydrographer*. She will have a length overall, molded 167 feet 5 inches; length between perpendiculars 143 feet; beam, molded, 31 feet 6 inches; minimum depth from top of main deck at side 18 feet 2 inches; displacement, molded at 10 feet 6 inches mean draft, salt water, approximately 740 tons; draft, forward, 9 feet 6 inches; draft, aft, 11 feet 6 inches.

Four Small Barge Tenders Opened

BIDS were recently received by the United States Engineer Office, Federal building, 16th street and 2nd avenue, Rock Island, Ill., for the construction of four 70 feet by 16 feet by 4 feet full deck small steel barges. The following proposals were submitted:

Name	Price
Dubuque Boat & Boiler Works, Dubuque, Iowa	$13,000
Kahlke Brothers, Rock Island, Ill.	14,000
Midland Barge Company, Midland, Pa.	14,280
Dravo Contracting Company, Pittsburgh, Pa.	15,900
Charles Hegewald Company, New Albany, Ind.	16,900
Rock Island Bridge & Iron Works, Rock Island, Ill.	16,992
Zier Boiler & Sheet Iron Company, New Albany, Ind.	19,760
Riter-Conley Company, Pittsburgh, Pa.	19,980
Howard Shipyards & Dock Company, Jeffersonville, Ind.	20,428

The bid of the Dubuque Boat & Boiler Company, Dubuque, Iowa, has been recommended for acceptance.

Fletcher Co. to Repair S.S. St. Anthony

THE United States Shipping Board has awarded a contract to the W. & A. Fletcher Company, Hoboken, N. J., covering repairs to the steamship *St. Anthony*, at a price of $27,300. The work involved includes the installation of passenger quarters, general overhauling and repairs. Bids were received at the New York offices of the Shipping Board recently. Other tenders submitted for the work were:

Name	Price
New York Harbor Drydock Company, Inc.	$27,697
Robins Drydock & Repair Company	29,889
Staten Island Shipbuilding Company	32,080
Morse Drydock & Repair Company	32,779
Theodore A. Crane's Sons Company	32,879
James Shewan & Sons, Inc.	35,449

Bethlehem Co. Bids Low on Repairs for Five Portland Trawling Co. Vessels

TENDERS were recently received and opened at the offices of the Portland Trawling Company, Fulton Fish Market, N. Y., covering repairs to the steam trawlers *Loon, Wild Goose, Kingfisher, Coot* and *Plover*, with the following results:

Steam Trawler Loon

Name	Price
Bethlehem Shipbuilding Corporation, Ltd.	$25,228
Staten Island Shipbuilding Company	29,620
Theodore A. Crane's Sons Company	29,975
Tebo Yacht Basin	30,611
Crowninshield Shipbuilding Company	35,274
Morse Drydock and Repair Company	37,205

Steam Trawler Wild Goose

Bethlehem Shipbuilding Corporation, Ltd.	$24,779
Theodore A. Crane's Sons Company	30,105
Staten Island Shipbuilding Company	30,406
Tebo Yacht Basin	32,050
Morse Drydock & Repair Company	37,161

Steam Trawler Kingfisher

Bethlehem Shipbuilding Corporation, Ltd.	$24,298
Staten Island Shipbuilding Company	28,109
Theodore A. Crane's Sons Company	28,435
Tebo Yacht Basin	29,562
Morse Drydock & Repair Company	34,425

Steam Trawler Coot

Bethlehem Shipbuilding Corporation, Ltd.	$25,088
Staten Island Shipbuilding Company	28,933
Theodore A. Crane's Sons Company	29,265
Tebo Yacht Basin	30,578
Morse Drydock & Repair Company	36,302

Steam Trawler Plover

Bethlehem Shipbuilding Corporation, Ltd.	$23,489
Theodore A. Crane's Sons Company	25,935
Staten Island Shipbuilding Company	26,423
Tebo Yacht Basin	26,929
Crowninshield Shipbuilding Company	30,935
Morse Drydock & Repair Company	31,291

No contracts have as yet been awarded.

Bethlehem Plant to Repair Freighter S.S. Manhattan Island

THE San Francisco plant of the Bethlehem Shipbuilding Corporation, Ltd., has been awarded the contract for a new stern frame for the Finkbine-Guild freighter *Manhattan Island*, at a price of $48,250. The vessel will be on drydock approximately 38 days. She was damaged in Los Angeles recently.

Bids for Eight Main Switchboards Received

BIDS were recently received and opened in the office of Captain R. D. Gatewood, manager of the maintenance and repair division of the United States Shipping Board, 45 Broadway, N. Y., for furnishing eight main switch and control boards, one for each of the eight Shipping Board vessels which are to be converted to Diesel-electric drive. The switchboards, which will control the current for both power and lights, and the motor starters for the auxiliaries, will be located in the engine room. The following tenders were submitted:

Name	Price
Westinghouse Electric & Manufacturing Company	$33,900
Walker-Seebold Company	43,151
Cutter Manufacturing Company	51,710
General Electric Company	71,670

Fletcher Co. Bids Low on S.S. Ponce Repairs

WITH a price of $53,327 and a time of 39 days, the W. & A. Fletcher Company, Hoboken, N. J., was low bidder for general reconditioning of the New York & Porto Rico steamship *Ponce*, of 3,506 gross tons, tenders for which were received in New York recently. Three other proposals were submitted as follows:

Name	Price	Days
Morse Drydock & Repair Company	$59,718	50
Staten Island Shipbuilding Company	67,640	100
Robins Drydock & Repair Company	69,250	45

The contract has not as yet been awarded.

Contract for S.S. Thode Fagelund Repairs Awarded

A CONTRACT for repairs to the steamship *Thode Fagelund* has been awarded by Captain K. Martinson, N. Y., to the Robins Drydock & Repair Company, Brooklyn, N. Y., at a price of $11,181 and a time of nine days, bids for which were received in New York recently. Other tenders submitted were as follows:

Name	Price	Days
Tietjen & Lang Drydock Company	$11,697	12
Morse Drydock & Repair Company	13,268	21
James Shewan & Sons, Inc.	14,130	15
Staten Island Shipbuilding Company	14,554	32

Several prices were submitted on a number of miscellaneous items which were not figured in the totals.

Contract for Nine Needle Flats Awarded

A CONTRACT for the construction of nine steel needle flats has been awarded to the Howard Shipyards and Dock Company, Jeffersonville, Ind., by the United States Engineer Office, Louisville, Ky., at a price of $18,457 and a time of 75 days. Tenders for the work were received in the Louisville office last month.

Dravo Co. to Construct Two Barges

A CONTRACT for the construction of two barges for the Vang Construction Company, Pittsburgh, Pa., has been awarded to the Dravo Contracting Company, Pittsburgh, Pa. The price involved was not given out.

Generated on 2024-09-12 14:15 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

Great Lakes Notes

Contract Awarded for Deepening Erie Basin

THE Great Lakes Dredge & Dock Company has been awarded the contract of deepening the Erie basin at Buffalo, N. Y. The task will require two years for completion when the basin will be dredged to a depth which will permit navigation by the largest lake ships. The improvement will provide much additional mooring space in the harbor for winter lake fleets.

New Record Established in Loading Bituminous Coal

A LOADING record of bituminous coal was made on July 9 at the P. & O. Railway dock in Toledo, O., when the *Benson Ford* took on 254 cars of coal in 4 hours and 50 minutes, actual time.

The fastest record ever made at a Lake Erie dock was 53 cars an hour while in this record there were 62 cars dumped in one hour which makes a mark for future efforts to shoot at. The average of the *Ford* was 47.8 cars per hour.

Steamers Sonoma and Crescent City Being Converted at River Rouge

THE *Sonoma* and *Crescent City* which were recently sold to the Nicholson Universal Company of Detroit, Michigan, are now being reconstructed for use in the automobile trade in the River Rouge yards of the Great Lakes Engineering Works.

Both vessels will have two new decks in the hold, and elevators will be installed. The *Sonoma* will have a new engine room and a 500-gallon fresh water tank on her texas roof. It was stated that when completed the two boats will be among the finest in the automobile carrying trade.

S. S. William Edenborn Wins Safety First Prize

AN announcement has been made that a member of the Welfare Plan Committee of the Lake Carriers Association of Cleveland, Ohio. has offered a prize for the best report each month by ship safety committees.

Each vessel in the association membership has a safety committee which is expected to make out a report each month on the most constructive acts of the committee for the prevention of personal injuries. Suggestions on new devices and clarity in reporting the subjects treated in the monthly meeting will count in making the award.

The first award has been made to the safety committee of the steamer *William Edenborn* of the Pittsburgh Steamship Company for the best April report.

Members of the prize-winning committee are: M. M. Crawford, mate, chairman; Max Nickel, first assistant engineer, secretary, Fred H. Phillips, boatswain; George Yuratick, wheelsman; Michael Beno, oiler, and Henry Keck, fireman.

Excellently prepared reports were also received from committees on the following ships: *William A. Amberg, George M. Humphrey, D. M. Clemson, Carl D. Bradley, W. F. White, Henry L. Shaw* and *Sir Henry Bessemer.*

Detroit & Cleveland Navigation Company to Operate Airplane Service

THE Detroit & Cleveland Navigation Company plans to begin the operation of flying boats carrying 26 passengers between Detroit, Cleveland and Buffalo within a year, if satisfactory equipment can be procured.

According to A. A. Schantz, president of the steamship line, it is planned to use the German-made Dornier Super Wal flying boats in the service, and the company now has an engineer in Germany investigating the possibility of adapting these flying boats to the transportation of passengers between Great Lakes Cities.

Mr. Schantz said that the Detroit & Cleveland Aerial Navigation Company, a subsidiary of the D. & C. Navigation Company, was organized eighteen years ago with a view to operating such a service when suitable equipment should be prepared to accept transportation by air. Mr. Schantz believes that the time has now arrived.

Shipbuilding Prospects on the Lakes Dull

PROSPECTS for new vessel construction at the Great Lakes shipbuilding yards are not very bright. Some of the big freighters are being sent to idle quarters this early in the lake season. The up-bound coal movement has been fair, as have been the down-bound cargoes of iron.

Considerable repair work is being done at the yards of the American Ship Building Company in Cleveland and Lorain. Toledo and Detroit yards report a fair line of work. No plans for any new big freighters are in sight, and, if operating companies with headquarters in Cleveland contemplate any new vessels, executives of these concerns are reticent.

Vessel operators hardly anticipate as heavy a movement of coal north as there was last season. A good grain movement later in the season is forecast.

Great Lakes Protective Association Elects Officers

AT a meeting of the advisory committee of the Great Lakes Protective Association, which was held recently in the office of the association in Cleveland, officers for the current year were elected. J. S. Ashley was re-elected chairman, George A. Marr, secretary, A. E. R. Schneider, treasurer, and J. A. Armstrong, assistant treasurer. Robert G. McCreary was elected counsel to fill the vacancy caused by the death of Harvey D. Goulder.

A committee was appointed to draft a resolution of regret upon the death of Mr. Goulder.

Shipping Board Honor Roll for the Last Six Months of 1927

THE fuel conservation committee of the United States Shipping Board Merchant Fleet Corporation has announced its semi-annual honor roll and honorable mention roll of chief engineers and masters covering the period July 1 to December 31, 1927. This list is issued twice a year and contains the names of the chief engineers and masters of the fifty best performing vessels in the Shipping Board fleet and also contains what is known as an honorable mention list which lists those vessels that have made very creditable performances but have not quite reached the standard that would entitle them to listing among the select fifty. This list has been the means of stimulating competition among the personnel of the Shipping Board vessels, particularly to gain a place on the honor roll, which entitles each chief engineer and master listed to a bonus of $50.

For the six months period covered by this honor roll as compared to the previous six months, the reduction in fuel per mile factor multiplied by the total miles traversed shows a saving of 155,438 barrels of oil and 970 tons of coal at sea. The average reduction in the fuel per hour in port multiplied by the total port hours shows a saving of 50,671 barrels of oil and 714 tons of coal.

SAVINGS AMOUNT TO $340,619

During this six months period the average price per barrel of bunker fuel oil was $1.60, and for Diesel oil $1.95, and for coal the average price was $6.04 per ton. Therefore, the reduction in fuel consumption represents a monetary saving for the six months as compared to the previous six months period of $340,619. In this connection it is to be noted that the price of oil per barrel for the period is twenty cents less than that used in previous honor rolls, which means that the saving shown for oil burners is 8.8 percent less than it would be if computed on basis of the former oil prices. The reduction in basic fuel cost, however, has effected a considerable reduction in total operating fuel cost in addition to the above mentioned savings.

This saving has been accomplished on a fleet that is now about nine years old; a fleet which has shown for each six month period a substantial reduction in fuel consumption. It is, therefore, the more creditable as it is but reasonable to expect with the increased age of the fleet and the improvement that has previously been effected that instead of a continued reduction in consumption that there should be an increased consumption.

Honor Roll*

America France Line.—S. S. *Waukegan* (5), E. Hamilton (3), chief engineer; C. Smith, master.

American Australia Orient Line.—S. S. *West Calera* (4), H. T. Berger, chief engineer; J. H. Hansen, master. S. S. *West Chopaka*, E. C. Matheson, chief engineer; C. H. Brunn, master.

American Diamond Lines.—S. S. *Innoko* (2), G. Merkle (1), chief engineer; H. Kiehne, master.

American India Line.—S. S. *Jalapa*, A. O. Fleming, chief engineer; R. Larsen, master. S. S. *Alaic* (5), G. Gustavson (1), chief engineer; L. Peterson, master. S. S. *Egremont* (1), J. E. Turpin (1), chief engineer; H. Hudson, master.

American Merchant Lines.—S. S. *Chickasaw* (1), F. Townsend, chief engineer; F. W. Myers, master. S. S. *American Farmer* (3), H. E. Com-

* Figures in parentheses indicate the number of previous honor rolls on which the vessel or chief engineer, as the case may be, has been listed.

Generated on 2024-09-12 14:15 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

stock (3), chief engineer; H. S. Myddleton, master. S. S. *American Trader* (1), C. R. Anderson (1), chief engineer; H. Fish, master.

American Pioneer Line (Atlantic Division).—S. S. *Archer* (2), J. D. Boyd, chief engineer; W. Satfeldt, master. M. S. *William Penn* (3), A. Tancott (3), chief engineer; R. Wright, master.

American Pioneer Line (Gulf Division).—S. S. *Invincible* (2), L. Angustine (4), chief engineer; F. Ulstad, master. S. S. *Patrick Henry* (1), G. R. Highouse (1), chief engineer; N. Lawrence, master. S. S. *Liberator* (1), N. Johnson, chief engineer; C. D. Smith, master.

Atlantic Australian Line.—M. S. *City of Dalhart*, G. Brown (1), chief engineer; R. Rose, master.

Dixie Mediterranean Line.—S. S. *Jolee* (3), E. Tillotson (2), chief engineer; H. Muller, master. S. S. *Labette* (2), E. Glaze (1), chief engineer; H. Peterson, master.

Dixie U. K. Line.—S. S. *West Wauna* (3), R. Leach (4), chief engineer; J. C. Wenzel, master. S. S. *Duquesne* (2), L. V. LeBeuf (2), chief engineer; G. D. Tipton, master.

Gulf West Mediterranean Line.—S. S. *Carlton* (3), J. B. Walsh (3), chief engineer; R. P. Doran, master. S. S. *Jomar* (3), M. P. Smith, chief engineer; D. E. Griffin, master. S. S. *Lafcomo* (1), J. McKerrall (5), chief engineer; A. Johannesen, master. S. S. *Ogontz* (4), B. Von Hein (4), chief engineer; B. Cheshire, master.

Mississippi Valley European Line.—S. S. *Syros* (1), H. Hammeros (1), chief engineer; S. C. Wallace, master.

Mobile Oceanic Line.—S. S. *Afoundria* (2), J. L. Jones (1), chief engineer; R. L. Hooper, master. S. S. *Maiden Creek* (3), P. Calages, chief engineer; E. L. Wheadon, master. S. S. *West Hardaway* (5), J. Sherlock (5), chief engineer; E. M. Tripp, master. S. S. *West Hika* (3), G. P. Hill (2), chief engineer; R. N. Sweeting, master. S. S. *Federal*, J. L. Churchill, chief engineer; J. O. Seiber, master.

Oregon Oriental Line.—S. S. *West O'Rewa* (2), J. P. Beeler (2), chief engineer; R. Wilson, master.

Oriole Lines.—S. S. *Artigas*, L. Watts, chief engineer; J. L. Martind, master. S. S. *Cold Harbor*, J. C. Kraft, chief engineer; G. W. Lorin, master. S. S. *Bellflower*, C. J. Erickson, chief engineer; J. L. Reynolds, master. S. S. *Balsam*, W. Schiller, chief engineer; S. U. Ford, master. S. S. *Hoxie* (2), W. A. Grenz (1), chief engineer; T. M. Lewis, master.

Southern States Line.—S. S. *Conness Peak* (2), T. Jerrett (1), chief engineer; C. P. Townsend, master. S. S. *Effna* (1), L. C. Whaley, chief engineer; H. S. Olsen, master. S. S. *Aquarius* (4), F. Frederickson (4), chief engineer; H. Ward, master. S. S. *Waban* (1), H. Grotemat (1), chief engineer; J. W. Blackwood master. S. S. *Bayou Chico* (3), B. Trachtenberg (3), chief engineer; R. B. Armstrong, master. S. S. *Emergency Aid*, F. S. Jurkowski, chief engineer; M. Cameron, master.

Texas Star Line.—S. S. *Cody* (3), E. Rasmussen (1), chief engineer; E. J. Madden, master. S. S. *Eldena*, R. B. Howard, chief engineer; H. A. Miller, master.

Texas Ukay Line.—S. S. *Cripple Creek*, C. Frederickson, chief engineer; J. P. Forrest, master. S. S. *Colorado Springs* (6), N. Hendrickson (6), chief engineer; J. Orwin, master.

United States Lines.—S. S. *Leviathan* (6), J. J. Fagan (6), chief engineer; H. Hartley, master. S. S. *George Washington* (5), W. G. Grace (5), chief engineer; H. Cunningham, master. S. S. *Republic* (3), A. W. Styron (3), chief engineer; A. B. Randall, master.

Yankee Line.—S. S. *Seattle Spirit* (1), E. H. Draper (1), chief engineer; G. V. Hedman, master.

Honorable Mention

American Australia Orient Line.—S. S. *West Ivan*, H. Brinkeroff, chief engineer; C. W. Winnett, master. S. S. *Nivaria*, J. T. Hare, chief engineer; G. Hagberg, master. S. S. *Faralon*, G. E. Wilcox, chief engineer; M. E. Shigley, master.

American Diamond Lines.—S. S. *Wytheville*, J. A. Bruno, chief engineer; J. Culver, master.

American Merchant Lines.—S. S. *American Banker*, F. C. Yandell, chief engineer; H. A. Pederson, master. S. S. *American Merchant*, D. Gill, chief engineer; E. F. Mitchell, master. S. S. *American Shipper*, W. Swatridge, chief engineer; S. E. Cummings, master.

American Oriental Mail Line.—S. S. *West Ison*, L. Drothning, chief engineer; J. Healey, master. S. S. *City of Spokane*, G. A. Snyder, chief engineer; N. Y. Green, master. S. S. *Cuprum*, H. L. Clements, chief engineer; A. Stinson, master.

American Palmetto Line.—S. S. *Coldwater*, E. J. Riggs, chief engineer; A. C. Forward, master.

American Pioneer Line.—S. S. *Eclipse*, E. J. Bernson, chief engineer; D. A. Smith, master.

African Republics Line.—S. S. *West Keene*, H. A. Saxe, chief engineer; J. MacDougall, master.

American West African Line.—S. S. *West Kebar*, G. A. Lohse, chief engineer; R. W. Weeks, master. S. S. *West Humhaw*, J. Cordes, chief engineer; A. W. Phillips, master. S. S. *Cahlamet*, F. B. Auld, chief engineer; R. S. Sparrow, master.

Atlantic Australian Line. S. S. *Arcturus*, J. P. Cox, chief engineer; C. Olsen, master. M. S. *Crown City*, D. J. Cody, chief engineer; H. T. McCaw, master. M. S. *West Cusseta*, D. F. Mentzer, chief engineer; D. Holth, master. M. S. *City of Rayville*, A. T. Engelbretsen, chief engineer; N. Leknes, master.

Dixie Mediterranean Line. S. S. *Quistconck*, C. B. Brown, chief engineer; G. Olofson, master. S. S. *Scantic*, D. Smith Barry, chief engineer: R. K. Vanderbeeck, master.

Dixie U. K. Line.—S. S. *Liberty Bell*, R. McCaffry, chief engineer; T. R. Sorenson, master. S. S. *Mount Evans*, R. A. Campbell, chief engineer; J. M. Wightwick, master.

Gulf West Mediterranean Line.—S. S. *Cardonia*, J. L. Dalton, chief engineer; W. B. Zechel, master. S. S. *West Chetac*, J. B. Peel, chief engineer; J. M. Dunn, master. S. S. *West Chatala*, S. Pritchett, chief engineer; I. M. Holt, master.

Mississippi Valley European Line.—S. S. *Carplaka*, A. Isaacson, chief engineer; H. P. Smith, master. S. S. *Cold Brook*, W. H. Evans, chief engineer; H. Fahrenwald, master, S. S. *Winston-Salem*, L. Erickson, chief engineer; A. W. Jamison, master.

Mobile Oceanic Line.—S. S. *Antinous*, M. Breisten, chief engineer; D. A. Stewart, master. S. S. *Hastings*, R. T. Lemon, chief engineer; I. Hystad, master.

Oregon Oriental Line.—S. S. *Oakridge*, P. L. Harreschou, chief engineer; G. F. Erbe, master.

Oriole Lines.—S. S. *Coelleda*, L. Henkel, chief engineer; C. Hillyer, master. S. S. *West Nosska*, C. Rice, chief engineer; E. W. Hickey, master. S. S. *Kearny*, H. T. Ellingsen, chief engineer; V. I. Ryan, master.

Southern States Line.—S. S. *City of Weatherford*, F. C. Gouner, chief engineer; J. P. Harburg, master. S. S. *Davenport*, J. Tierney, chief engineer; F. Ward, master.

Texas Mediterranean Line.—S. S. *Saguache*, C. J. Spatz, chief engineer; F. M. Simpson, master.

Texas Star Line.—S. S. *Chester Valley*, R. Scott, chief engineer; C. T. McMains, master. S. S. *Edgemoor*, C. R. Brown, chief engineer; A. Colbury, master.

Texas Ukay Line.—S. S. *West Ekonk*, F. Breaux, chief engineer; H. Simmons, master. S. S. *West Modus*, W. M. Johnson, chief engineer; E. Haby, master.

United States Lines.—S. S. *President Harding*, J. W. Rakow, chief engineer; T. Van Beek, master.

Yankee Line.—S. S. *West Campgaw*, E. Inness, chief engineer, F. E. Hardy, master. S. S. *Lorain*, J. E. Miller, chief engineer; J. M. Caulk, master.

World Shipbuilding Declines

A DECLINE of more than 230,000 gross tons in the volume of merchant vessels being constructed throughout the world is shown in a statement recently issued by Lloyd's Register of Shipping based on returns from all maritime countries for the quarter which ended June 30. As a result, almost half a million tons less of merchant shipping are being built now than at the beginning of the year.

Conditions in Great Britain and Ireland are chiefly responsible for the decline, for while the work in the hands of shipbuilders there fell off 238,000 tons in the past quarter, the figures for all other countries combined show a slight increase. Gains are reported for Holland, France, Russia, Japan and Sweden. For the United States there was a decrease of about 550 tons.

A general comparison of the last two quarters is given by Lloyd's Register in the following table, the figures representing gross tons:

	June 30, 1928	Mar. 31, 1928
Great Britain and Ireland	1,202,610	1,440,842
United States	55,502	56,049
Other countries	1,402,350	1,396,360
World total	**2,660,462**	**2,893,251**

As a result of the changes, Great Britain and Ireland, which at the end of March were building almost as much shipping as all the other countries combined, are now constructing only 45.1 percent. The share of the United States in world shipbuilding during the same period has improved slightly, moving from 1.9 percent of the total to 2 percent.

Motorship construction did not share in the declines of the quarter just ended, registering a small gain over the previous period, with the result that there are now about 340,000 gross tons more of vessels equipped with internal combustion engines being constructed than of all other types combined. While motorship construction does not lead in Great Britain and Ireland, it represents nearly two-thirds of the work in the shipyards of all the other maritime countries, taken together.

American Bridge Co. Receives Towboat Contract

A CONTRACT for the construction of a towboat has been awarded by the Tennessee Coal, Iron & Railroad Company, Birmingham, Ala., to the American Bridge Company, Ambridge, Pa. The price involved was not given out.

Supply Trade

Clutch and Gear Transmission for Diesel Engines

FAIRBANKS, Morse & Company, Chicago, Ill., has issued its semi-monthly bulletin in which non-reversible marine Diesel engines are described. The Fairbanks-Morse Diesel in 8½ by 10-½-inch cylinder size is now built with clutch and gear shift transmission and a power take-off for deck machinery.

Ordinarily the speed of a marine Diesel engine can be sufficiently reduced by means of the speed control to take care of all slow running requirements. In some cases, particularly on certain classes of fishing boats, lower speed operation and a power take-off has a marked advantage and this is described fully in this article.

Westinghouse Company to Build Marine Equipment at So. Philadelphia Plant

IN anticipation of the stimulus to ship construction which the provisions of the Merchant Marine Act of 1928 have insured, the Westinghouse Electric & Manufacturing Company has announced that the facilities of the South Philadelphia plant will be devoted largely to the construction of marine propelling and other equipment.

This plant was built during the war under the direction of H. T. Herr, vice-president of the company, who was also in charge of its operation. The location, facilities, arrangement and personnel constitute one of the most complete and efficient manufacturing units in the east. During and since the war propelling machinery was built here which has subsequently logged a total of 14,000,000 miles. This machinery was installed in the battleship *Colorado*, light cruisers *Omaha*, *Cincinnati* and *Milwaukee*, forty destroyers and more than two hundred of the merchant fleet.

Generated on 2024-09-12 15:02 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN

Business and Personal

The **Plymouth Cordage Company** has announced the opening of a sales branch, with ample stocks of rope and tying twines, at 225 Broadway, New York.

The engineering and sales office of the **Bessemer Gas Engine Company** has been moved from 709 Linwood avenue, Tuxedo Park, Baltimore, Md., to 1109 National Press building, Washington, D. C.

H. E. Booth, for nearly 20 years connected with the coal department of the **M. A. Hanna Company,** Cleveland, O., has resigned to become vice-president of the **Pittsburgh Coal Company,** in charge of the sales department. Mr. Booth will have his headquarters in Pittsburgh.

Vreeland Tompkins, president of the **Smooth-On Manufacturing Company,** Jersey City, N. J., was awarded the honorary degree of Master of Science at the commencement exercises of Rutgers University. The degree was conferred for distinguished accomplishment as a chemist and inventor.

W. H. Butler, formerly located at the Bayway, N. J. research laboratory of the **Standard Oil Company of New Jersey,** in charge of testing internal combustion motors, is now located at New York with the fuel oil division of this company for the purpose of assisting Diesel engine owners and operators with any problems they may be confronted with in the economical operation of Diesel engines.

Colonel Edward H. Schulz, river and harbor improvement expert, has recently become head of the Great Lakes Division of the **United States Army Engineering Corps,** succeeding **Colonel Spencer Cosby,** divisional engineer at Cleveland since 1922. Since his graduation from West Point in 1905, Colonel Schulz has spent most of his career dealing with waterway improvement projects. Colonel Schulz was a member of the Mississippi River Commission, which studied methods of flood control, and also was senior member of the Great Lakes Ship Canal Board.

The **National Soot Blower Company, Inc.,** Groveville, N. J., has recently appointed several new Southern representatives, as follows: **Fuel Efficiency Engineering Company,** American Trust Building, Birmingham, Ala.; **A. S. Furtwangler,** 4 South Broad Street, Charleston, S. C.; **Reed & Duecker, Inc.,** 171 North Main Street, Memphis, Tenn.; **Buckmaster-Luch-Malochee, Inc.,** Industrial Homestead Building, New Orleans, La. and **Henry Eggelhof,** Construction Industries Building, Dallas, Texas. The above will act as exclusive distributors for the national soot blower which is designed for use with return tubular and Scotch marine boilers.

Trade Publications

WINTON NEWS.—The July issue of *Winton News*, a monthly bulletin published by the Winton Engine Company, Cleveland, O., has been distributed. This issue contains interesting information concerning the transatlantic sailing race for the King and Queen of Spain's cups together with descriptions of the bark *Aloha* and the schooner *Guinevere*.

ANNOUNCEMENT.—The Bethlehem Shipbuilding Corporation, Ltd., of Bethlehem, Pa., has issued a folder announcing the addition of the Atlantic Works to the company's facilities in the Port of Boston.

NICKEL STEEL.—Bulletin No. 12 on the subject of "Alloy Steel for Boiler Construction" has just been published by the International Nickel Company, Inc., New York, together with a bulletin pointing out the increase of strength in cast iron by the use of nickel.

ELECTRIC SPEED INDICATOR.—Two bulletins, describing electric speed indicators have been issued by the Weston Electrical Instrument Corporation, Newark, N. J. These instruments can be utilized for determining the speed of rotation of all types of revolving machinery and, consequently, have possible applications in the marine field. Details of the electrical principles involved and illustrations of various types of indicators are included in the bulletins.

PLUMBING.—The J. L. Mott Iron Works, New York, has issued the first edition of catalogue M which shows a complete line of marine plumbing manufactured by this concern for use aboard every type and size of motor boat, yacht, freight vessel, passenger liner or man-o-war. Many essential improvements have been made in water closets, baths, pumps, etc., which are presented in this work.

PACKINGS.—The Martell Packings Company, Elyria, Ohio, through Thomas H. Brown, New York, has issued a catalogue describing the points of superiority of the Martell metallic packings for all forms of marine use.

DIESEL ENGINES.—Busch-Sulzer Bros.—Diesel Engine Company, St. Louis, Mo., has issued an attractively published booklet entitled "Large Yacht Diesels" in which the Types M and E. Busch-Sulzer engines are described.

CENTRIFUGAL PUMPS.—A new catalogue featuring the Cameron line of multi-stage centrifugal pumps for boiler feeding, hydraulic service in steel mills, pipe lines, etc., has been issued by the Ingersoll-Rand Company, New York. This catalogue covers the application, operation and construction of these modern, highly efficient pumps.

ARC WELDING EQUIPMENT.—The Lincoln Electric Company, Cleveland, Ohio, has recently issued the Engineering Bulletin No. 206 in which the variable voltage, single operator type and the constant potential, multiple operator type welders are compared. The discussion covers the first cost of equipment plus installation cost, the problem of interference between operators on multiple operator sets and the economy of power of variable voltage equipment.

Marine Societies

America

American Marine Association, 30 Church St., New York. President—Col. E. A. Simmons.

American Marine Standards Committee. Chairman, Colonel E. A. Simmons. Secretary, A. V. Bouillon, Division of Simplified Practice, Department of Commerce, Washington, D C.

American Society of Marine Designers. Secretary—B. G. Barnes, 202 Kendrick Ave., Quincy, Mass.

American Society of Marine Engineers. 605 Market St., San Francisco, Calif. Presiednt—Henry F. Gelhaus. Secretary—W. H. Thille.

American Society of Naval Engineers. Navy Department, Washington, D. C. Secretary Treasurer & Commander H. B. Hird, U. S. N., Bureau of Engineering, Navy Department, Washington, D. C.

American Steamship Owners' Association, 11 Broadway, New York. President—H. B. Walker.

Atlantic Coast Shipbuilders' Association. 1600 Walnut Street, Philadelphia, Pa. Secretary—C. S. King.

Council of American Shipbuilders, Inc., 50 Broadway, New York. President—Homer L. Ferguson. Secretary-Treasurer—Henry C. Hunter.

Jersey Marine Club, 4th and River Streets, Hoboken, N. J. Secretary—Fred L. Broad.

Lake Carriers' Association. President J. S. Ashley. Secretary—George A. Marr, Rockefeller Building Cleveland O.

National Association of Engine and Boat Manufacturers, 420 Lexington Avenue, New York City. Secretary—Ira Hand.

National Association of Masters, Mates and Pilots, National Secretary—M. D. Tenniswood, 308 Vine St., Camden, N. J.

National Marine Engineers' Beneficial Association. Headquarterse 311-315 Ma hinists Building, Washington, D. C. Prsident—Wm. F. Yates. Secretary—Albert L. Jones.

Neptune Association, 21 Pearl St., New York City. Secretary-Treasurer—Captain John F. Milliken.

New York and New Jersey Dry Dock Association. 111 Broadway, New York. President—Jonathan Moore.

Ocean Association of Marine Engineers. 15 Whitehall St., New York. Secretary—Bert L. Todd.

Port of New York Authority, 75 West Street, New York. Chairman—George S. Silzer. Secretary—Wilson J. Vance.

Society of Naval Architects and Marine Engineers, 29 West 39th Street, New York. Secretary and Treasurer—Daniel H. Cox.

The Maritime Association of the Port of New York, 78 Broad St., New York City President—John Dowd Secretary—John F. Manning.

The New York Tow Boat Exchange 11 Moore St., New York. Manager—Langdon W. Smith.

The Propeller Club of the Port of New York. President—Harry W. Parsons, 111 Broadway, New York. Secretary—W. Z. Gardner, 136 Liberty Street, New York.

United States Naval Institute. Naval Academy, Annapolis, Md. Secretary and Treasurer—Captain H. A. Baldridge, U. S. N.

United States Ship Operators' Association, 149 Broadway, New York. President—Winchester Noyes.

Canada

Grand Council N. A. of M. E. of Canada. Grand Secretary-Treasurer—W. A. MacDonald 62 Albert St, Halifax N. S.

Great Britain

Institute of Marine Engineers Incorporated, 85-88 The Minories, London E.1.

Institution of Engineers and Shipbuilders in Scotland, 39 Elmbank Crescent, Glasgow.

Institution of Naval Architects, 5 Adelphi Terrace, London, W. C.

North East Coast Institution of Engineers and Shipbuilders. Bolbec Hall, Westgate Road, Newcastle-on-Tyne.

France

Association Technique Maritime et Aëronautique. Secrétariat General—7, rue de Madrid, Paris (8e).

Italy

Collegio Degli Ingegneri Naval e Meccanici In Italia.

Generated on 2024-09-12 14:21 GMT / https://hdl.handle.net/2027/mdp.39015013713352
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF MICHIGAN